SP01721

SONY

HD DIGITAL VIDEOCASSETTE RECORDER

HDW-F500

PARALLEL INTERFACE KIT
BKDW-509

HD-SD CONVERTER BOARD
HKDV-501A

HD LINE CONVERTER BOARD
HKDV-502

SDTI BOARD
HKDV-506A

HD PULL DOWN BOARD
HKDV-507

HDCAM Tele-File

ISR Interactive Status Reporting

MAINTENANCE MANUAL Part 2
Volume 1 1st Edition (Revised 1)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

HDW-F500	Serial No. 10101 and Higher
BKDW-509	Serial No. 10001 and Higher
HKDV-501A	Serial No. 10001 and Higher
HKDV-502	Serial No. 10001 and Higher
HKDV-506A	Serial No. 10001 and Higher
HKDV-507	Serial No. 10001 and Higher

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Manual Structure

Purpose of this manual

This manual is the maintenance manual part 2 Volume 1 of the HD digital video cassette recorder HDW-F500.
This manual is intended for use by trained system and service engineers, and is provided information that is premised the service (service overview, adjustments, parts replacement) for this unit and the optional board.

Related manuals

Besides this maintenance manual part 2 Volume 1, the following manuals are available.

- **Operation Manual (Supplied with this unit)**
  This manual is necessary for the use and operation (and installation) of this unit.
  Part No. : 3-203-128-XX

- **Maintenance Manual Part 1 (Supplied with this unit)**
  This manual is provided the information required for the installation (including with option board), maintenance information and information for the service such as replacement of plug-in boards.
  Part No. : 3-203-111-XX

- **Maintenance Manual Part 2 Volume 2 (Available on your request)**
  This manual is provided information that is premised the parts level service (board layouts, schematic diagrams, detailed parts list and the like.) for this unit and optional board. If this manual is required, please contact to your local Sony Sales Office/Service Center .
  Part No.: 9-968-553-XX

- **Protocol Manual for Remote (9-pin) (Available on your request)**
  This manual is explained the protocols for controlling this unit by the RS-422A (9-pin serial remote). If this manual is required, please contact to your local Sony Sales Office/Service Center .
  Part No. : 9-968-513-XX

- **BKDW-509 Interface Manual (Available on your request)**
  This manual is explained the protocols for controlling this unit by the parallel 50-pin. If this manual is required, please contact to your local Sony Sales Office/ Service Center .
  Part No. : 9-967-559-XX

- **ISR Protocol Manual (Available on your request)**
  This manual is explained the ISR functions of this unit. If this manual is required, please contact to your local Sony Sales Office/Service Center .
  ISR: Interactive Status Reporting / Integrated Equipment Management Function
  Part No. : 9-968-521-XX

- **"Semiconductor Pin Assignments" CD-ROM (Available on request)**
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in B&P Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual for the corresponding unit. The maintenance manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Contents

The maintenance manuals part 2 are organized by following sections.

Maintenance Manual Part 2 Volume 1

Section 1 Service Overview
This section is described about the extension board, NVRAM and flash-memory.

Section 2 General Information for Electrical Alignment
This section is described about the tools, measurement equipments and internal test signals.

Section 3 Electrical Alignment
This section is described about the electrical adjustment for the power supply, system control, servo, analog audio, RF, digital video, digital audio and the like.

Section 4 Electrical Alignment (Option Board)
This section is described about the electrical alignment for option board.

Section 5 Replacement of Main Parts
This section is described about the replacement for the drum head, capstan motor, reel motor, tape guides, cassette compartment, fan motor, power supply unit and the like.

Section 6 Alignment after Replacement of Main Parts
This section is described about the tape path alignment and electrical alignment after replacement of main parts.

Maintenance Manual Part 2 Volume 2

Section 1 Location of Mounted Circuit Boards

This section is described about the location of mounted circuit boards.

Section 2 Semiconductor Pin Assignments

This section is described about the semiconductor pin assignments.

Section 3 Spare Parts

This section is described about the detailed spare parts list and exploded views.

Section 4 Block Diagrams

This section is described about the block diagrams in the alphabetical order.

Section 5 Board Layouts

This section is described about the board layouts of mounted circuit boards in the alphabetical order.

Section 6 Schematic Diagrams

This section is described about the frame wiring and schematic diagrams of the mounted circuit boards in the alphabetical order.

Section 1
Service Overview

1-1. Use of Extension Board

CAUTION

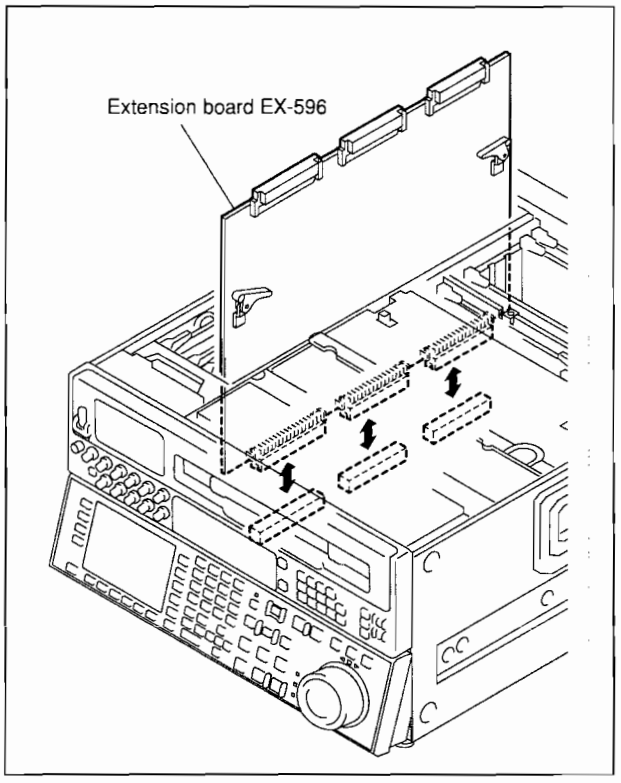
To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the mounted circuit boards.

Extension board (L)

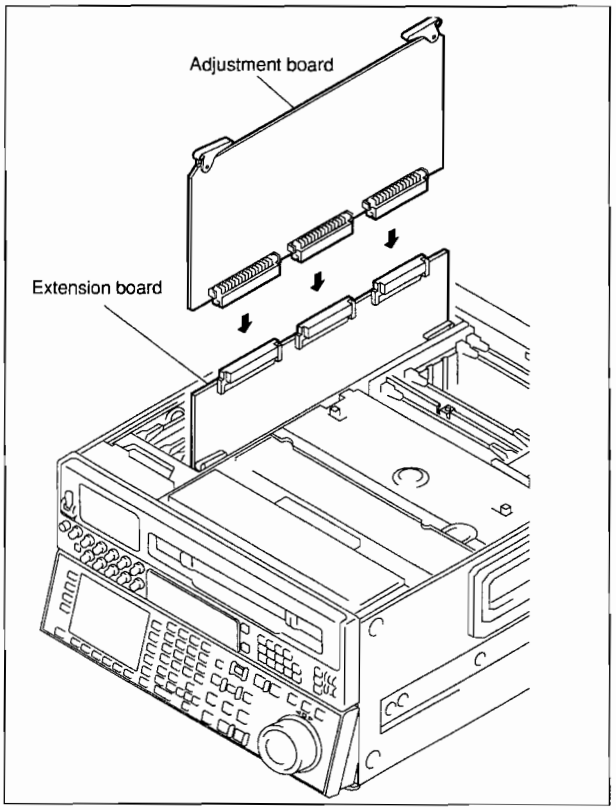
- **EX-596 : A-8312-823-A**

  Adjustment board : APR-49, DIF-91A, DPR-143 and SS-88 boards

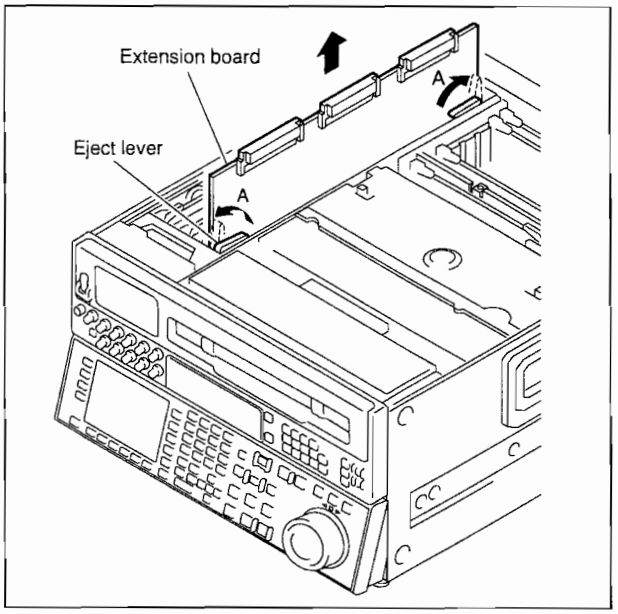
1. Turn off the power.
2. Remove the board to be adjusted from the unit. (Refer to the section 2-10-1 in the maintenance manual part 1.)
3. Insert the extension board along the board guide rail.



4. Insert the board to be adjusted in the connector on the extension board for adjustment.



5. After adjustment is completed, pull out the board.
6. Push the eject lever in the direction indicated by the arrows A, then pull out the extension board.

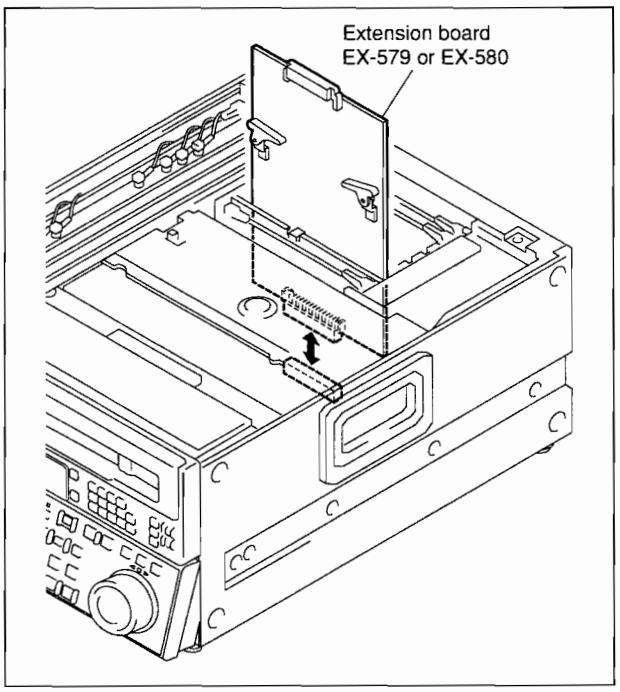


7. Insert the adjusted board in the former slot. (Refer to the section 2-10-1 in the maintenance manual part 1.)

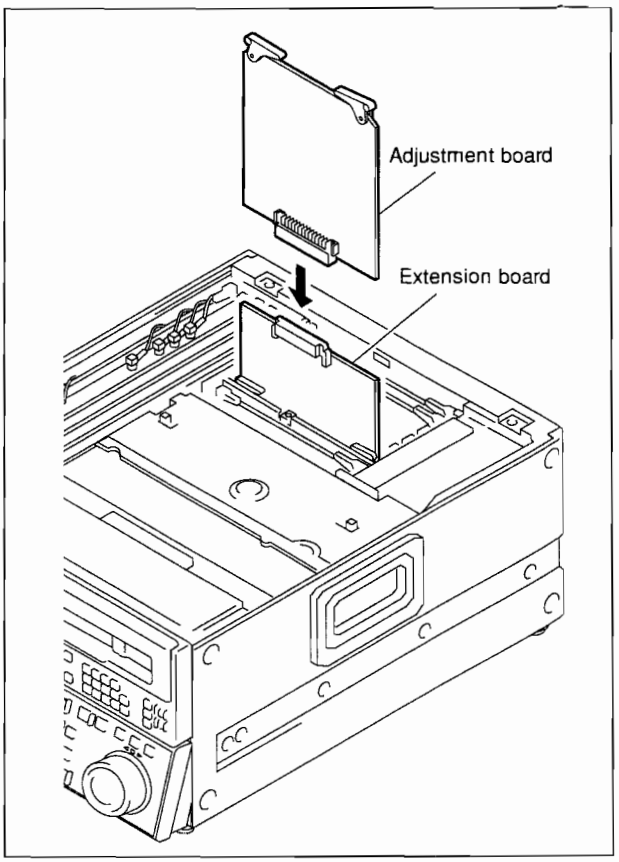
Extension boards (S)

- **EX-579 : A-8312-821-A**
  Adjustment board : CUE-10, DCP-26, EQ-85 and PD-94 boards
- **EX-580 : A-8312-822-A**
  Adjustment board : PSW-51 board
  (Serial No.10101 through 10405)
  Adjustment board : PSW-75 board
  (Serial No.10406 and Higher)

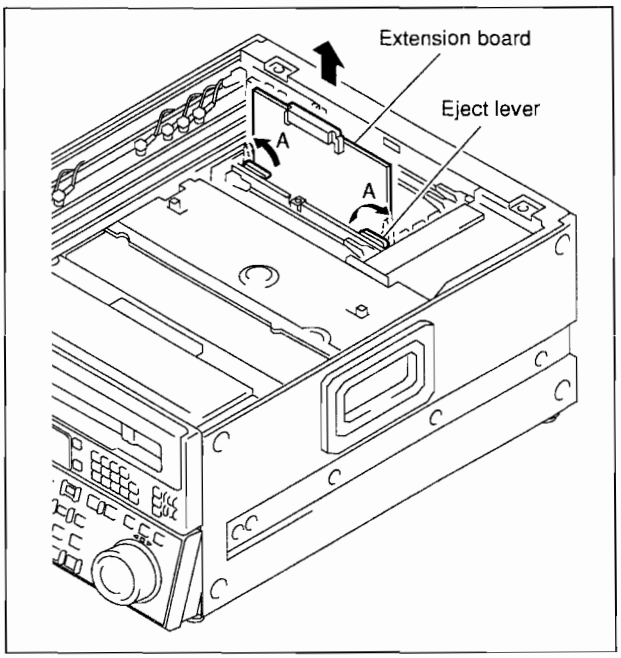
1. Turn off the power.
2. Remove the board to be adjusted from the unit.
   (Refer to the section 2-10-1 in the maintenance manual part 1.)
3. Insert the extension board along the board guide rail.



4. Insert the board to be adjusted in the connector on the extension board for adjustment.



5. After adjustment is completed, pull out the board.
6. Push the eject lever in the direction indicated by the arrows A, then pull out extension board.



7. Insert the adjustment board in the former slot.
   (Refer to the section 2-10-1 in the maintenance manual part 1.)

1-2. NVRAM

This section describes the type of the stored data on each board, and the initialization and the adjustment of the data when the adjustment and the setting data items are lost (during the IC and the board replacement).

1-2-1. DR-307 Board (IC101)

Data names

- Servo and DT adjustment values
- Hours meter
- Serial number and destination

Replacement procedures and adjustment

Notes

- Actual typefaces differ from the ones shown in diagrams in this manual. Also, the content of diagram are only one example of many.

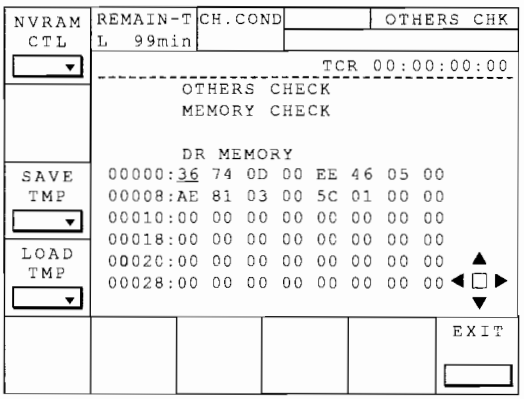
- If the error messages below appear on the display, do not perform "1. Data Storage" because the data of IC101 (on the DR-307 board) is defective.
  In this case, perform "3. Data Write" by the automatically stored data on the SS-88 board (IC414) after performing "2. Replacement of DR-307 Board or IC101".

Error messages

- "DR", "DT", "SV1" and "SV2" of Error-92
- "DR", "DT" and "SV1" of Error-93
- Error-97

1. Data Storage

(1) Press the MAINTENANCE switch using an object with the thin tip to display the "MAINTENANCE INFORMATION DISPLAY" screen.
(2) Press the [F 8] (MAINTE EXEC) key while pressing the [SFT] key to display the "MAINTENANCE" screen.
(3) Press the [F 9] (OTHERS CHECK) key to display the "OTHERS CHECK" screen.
(4) Press the [F 2] (MEMORY CHECK) key to display the "MEMORY CHECK" screen.
(5) Press the [F 9] (BOARD SELECT) key while pressing the [SFT] key to display the "DR MEMORY" screen.



(6) Press the [F 3] (SAVE TMP) key to display the "SAVE SYS TEMPORARY MEMORY" screen.
(7) After "SAVE SYS MEMORY" is selected, press the [F 10] (EXIT) key and store the data into IC414 on the SS-88 board.

2. Replacement of DR-307 Board or IC101

(1) Turn off the power and replace the DR-307 board or IC101.
(Refer to the section 5-33-11.)

3. Data Write

(1) Turn on the power and perform steps (1) through (5) in "1. Data Storage".
(2) Press the [F 4] (LOAD TMP) key to display the "LOAD SYS TEMPORARY MEMORY" screen.
(3) After "LOAD SYS MEMORY" is selected, press the [F 1 0] (EXIT) key and load the stored data into a buffer.
(4) Press the [F 1] (NVRAM CTL) key to display the "DR_NVRAM CONTROL" screen.
(5) After "SAVE ALL DATA" is selected, press the [F 1 0] (EXIT) key and write data into the replaced IC101.
(6) Perform the adjustments below.
(Refer to the section 4-4 in the maintenance manual part 1.)
- AUTO ADJ
- CAPSTN SPEED
- RF SW AUTO
- CAPSTN FG LVL
- DRIVE GAIN
- HEAD OFFSET

1-2-2. SS-88 Board (IC414)

Data names

- Setup data (VTR BANK 1 to 8)
- Cue point data

Replacement procedures

(1) Store all data in a memory card.
(Refer to the section 4-1-5 of the operation manual.)
(2) Turn off the power and replace the SS-88 board or IC414.
(Refer to the section 2-10 in the maintenance manual part 1.)
(3) Turn on the power. Error message "ERROR-A3 (SYS NV-RAM CHECK SUM ERROR)" appears on the display. Turn on the power again and clear the error log after confirming that no error message appears.
(Refer to the section 4-2-2 in the maintenance manual part 1.)
(4) Confirm "CANCEL EDIT" and "REAL TIME", and set them again.
(Refer to the section 4-2-2 in the maintenance manual part 1.)
(5) Write the data from the memory card in the replaced IC414.
(Refer to the section 4-1-5 in the operation manual.)

1-3. Replacing Memory Backup Battery

BT100 is a memory backup battery, which is mounted on IC113 socket on the CP-266B board.
IC113 is a memory IC so that store the setup data and CUE data.

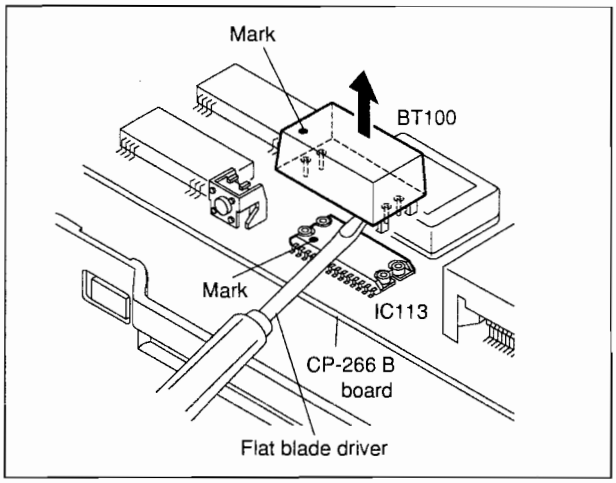
And the same memory back up battery is mounted on IC414 socket on the SS-88 board. (Board address : J-4)

Notes

- The standard replacement cycle of the memory backup battery is about 7 years.
- Be sure to store the all setup data (and CUE data if necessary) to the memory card before replacing the memory backup battery.
  (For details on how to store, refer to section 4-1-5 in operation manual.)

CP-266B board

1. Turn off the power.
2. Remove the control panel assembly.
   (Refer to section 2-4 in maintenance manual part 1.)
3. Remove the cover. (Refer to section 5-31.)
4. Insert a flat blade driver between IC113 and BT100, then remove BT100.



5. Carefully install a new battery, ensuring that the 1-pin mark's on the IC113 and IC116 are aligned.
6. Assemble the control panel and install it to the unit.
7. Read out the data in memory card.

SS-88 board

1. Turn off the power.
2. Remove the SS-88 board.
   (Refer to section 2-10 in maintenance manual part 1.)
3. Replace the memory back up battery refer to steps 4 onwards of replacing procedure at CP-266B board.

- Memory back up battery :
  1-767-156-11 (M4T28-BR12SH1)

Section 2
Electrical Alignment Overview

Introduction of Electrical Alignment

Electrical adjustments which are required when electrical parts are replaced are explained in maintenance manual part 2. When periodic maintenance parts are replaced, refer to maintenance manual part 1.

2-1. Measuring Equipments and Fixtures Required

It is recommended to use the following equipments or the equivalents.
Each equipment is available as a standard product.

Measuring Equipments

Description	Model Name	Remarks
Audio level meter	Hewlett- Packard HP3400A	
Audio oscillator	Hewlett- Packard HP3435	For analog audio adjustment/check
Audio analyzer	Tektronix AA501A-option 02	
Audio generator	Tektronix SG505-option 02	
Time code generator	SONY BVG-1600	
Time code reader	SONY BVG-1500	
Oscilloscope	Tektronix 2465B	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
HD SDI signal generator	Shibasoku TG37AX, Tektronix TG2000 (HDVG1, AWVG1)	
SDI DA converter	SONY PFV-D50 + HKPF-102 (59.94i /60i/only)	
HD SDI compatible monitor	SONY BVM-D20F1J/BVM-D14H5J) or Shibasoku CM202H	
Waveform monitor	Tektronix WFM-601I Tektronix WFM-1125 Tektronix 1730D Leader Electronics LV5152DA	For D1 SDI For HD SDI For D2 SDI, Analog composite For HD SDI
Serial digital picture monitor	SONY BVM-9044QD SONY BVM-2016 + BKM-2090	For D1 Signal input For D2 Serial signal input

Fixtures

Description		Sony Part No.	For use
Extension board (L)	EX-596	A-8312-823-A	For large card board
Extension board (S)	EX-579	A-8312-821-A	For small card board (for CUE-10, DCP-26, EQ-85)
Extension board (S)	EX-580	A-8312-822-A	For small card board (for PSW-51/75)
Set of extension cable		J-6420-320-A	For extension of power unit
SDI extension cable		J-6510-010-A	For check of RX board, TX board
Alignment tape	HR5-1A HR2-1A	8-960-076-01 8-960-076-11	For adjustment of video & audio systems For tracking adjustment
IC card socket	CDS-20	A-8319-485-A	For updating the software
Adjustment driver		–	Made of ceramic

* For more detail information about measuring equipments and tools, refer to section 2-13 "Fixtures and Measuring Equipments" of maintenance manual part 1.

2-2. Internal Test Signal

There are the following internal test signals for checking the HDW-F500.
Regarding video and audio checking procedures, refer to section 4-3-5 "AUDIO/VIDEO System Check" of maintenance manual part 1.

Video Signals

COLOR BARS
MULTI BURST
10 STEPS
PULSE & BAR
RAMP
BLACK

Audio Signals

silence
1 kHz SINE 0 VU
1 kHz SINE BURST/1F
1 kHz SINE BURST/2F
1 kHz SINE BURST/5F
1 kHz SINE BURST/8F
1 kHz SINE BURST (10)
4 kHz SINE BURST (40)
SAW WAVE

Section 3
Electrical Alignment

3-1. Power Supply/System Control Adjustment

Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Digital Voltmeter (ADVANTEST TR6845 or equivalent)
- Adjustment Screwdriver (made of ceramic)

3-1-1. Power Unit Output Voltage Check

Note

When measuring the voltage, be very careful not to short-circuit the connector's pins.

Preparation for adjustment	Specification	Adjustment
· Remove the bottom panel. · Turn on the power. · Adjust the voltage of connector with digital voltmeter.	CN151-1/MB-863 (J-7) −15.0 ±1.0 V CN151-2/MB-863 (J-7) +15.0 ±0.5 V CN151-7/MB-863 (J-8) +3.4 ±0.2 V CN151-8/MB-863 (J-8) +5.1 ±0.25 V CN151-9/MB-863 (J-8) −8.0 ±1.0 V CN151-10/MB-863 (J-8) +8.0 ±1.0 V CN156-1/MB-863 (Q-5) +18.0 ±2.0 V	Check

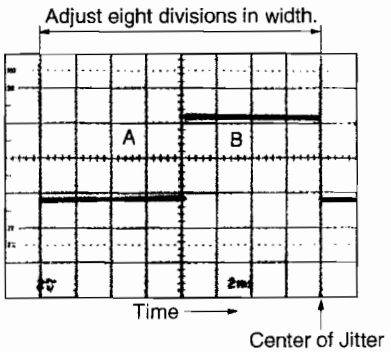
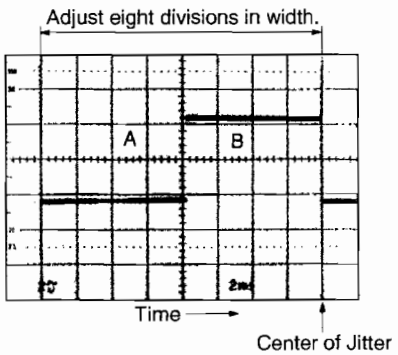
3-1-2. Search Dial Assembly Sensor Duty Adjustment

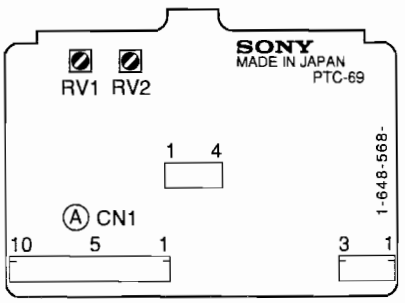
CAUTION

The following adjustments should be carried out only when the component on the PTC-69 board had been replaced or when the potentiometer (RV) had been turned carelessly.

Preparation

(1) Remove the search dial from the lower control panel.
(2) In order to connect an oscilloscope probe, solder the lead wires on pins 2, 3 and 6 of CN1 on the PTC-69 board as test terminals.
(3) After the adjustment, desolder the lead wires.

Preparation for adjustment	Specification	Adjustment
Step 1 • Connect CH1 of oscilloscope to CN1-2 (X) and CN1-6 (G) of the PTC-69 board. • Set the search dial in JOG mode. • Turn the seach dial in the REV direction constantly at a uniform rate.	CN1 pin-2 & pin-6  A : B = 1 : 1	⊘RV2/PTC-69 (A-1)
Step 2 • Connect CH1 of oscilloscope to CN1-3 (X) and CN1-6 (G) of the PTC-69 board. • Set the search dial in JOG mode. • Turn the seach dial in the FWD direction constantly at a uniform rate.	CN1 pin-3 & pin-6  A : B = 1 : 1	⊘RV1/PTC-69 (A-1)



3-1-3. CCM-33A Board Adjustment

Note

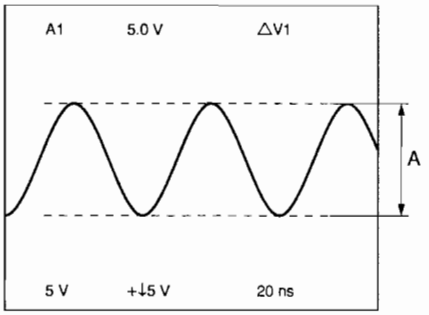
This adjustment need only be performed when the CCM-33A board or SE-435 board has been replaced.

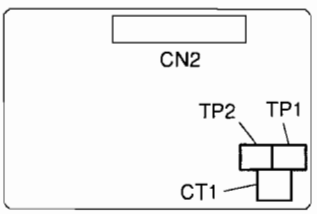
Preparations

Note

Pay careful attension to the following points to perform the adjustment correctly.

- Be sure to eject the cassette tape from HDW-F500 before adjustment.
- Do not perform adjustments by using the SE-435 board of another HDW-F500.
- Be sure to attach the SE-435 board to the unit.
- Do not place metal objects (excluding the chassis plate) near the SE-435 board.

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the oscilloscope as follows. CH-1 : TP1/CCM-33A board GND : Chassis plate CH-2 : TP2/CCM-33A board GND : Chassis plate **Note** Do not contact the GND of the probe to the CCM-33A board. Otherwise the CCM-33A board may damage. **Setting of the oscilloscope** VERTICAL CH1 : 5 V/DIV, DC CH2 : 5 V/DIV, DC MODE : CH2 INVERT, ADD, 20 MHz BW LIMIT = OFF HORIZONTAL 20 n SEC/DIV TRIGGER CH1, DC LEVEL : 5 V	 A = Maximun value (Maximum sine waveform more than 14 Vp-p)	⊘CT1/CCM-33A



CCM-33A Board (A side)

3-2. Analog Audio/Time Code System Adjustment

3-2-1. Preparation

1. Item List

No.	Item	Board	Adjustment	Point
1	CUE INITIAL ADJUSTMENT			
	EE UNITY LEVEL	CUE-10	RV801	TP701
	CUE PEAK SIGNAL	CUE-10	RV102	TP108
	CUE OUT LEVEL	CUE-10	RV700	CUE
	CUE DISTORTION	CUE-10	RV104	CUE
2	CUE UNITY LEVEL	CUE-10	RV121	CUE
3	CUE MONITOR LEVEL	CUE-10	RV122	MONITOR L/R
4	CUE PB FREQ RESPONSE	CUE-10	RV901	CUE
5	CUE PB LEVEL	CUE-10	RV114	TP110
		CUE-10	RV120	CUE
6	FULL ERASE CURRENT	CUE-10	CHECK	TP506 (X), TP503 (G)
7	CH ERASE CURRENT	CUE-10	LV500	TP505 (X), TP502 (G)
		CUE-10	RV502	TP505 (X), TP502 (G)
		CUE-10	LV501	TP507 (X), TP504 (G)
8	BIAS TUNE, TRAP	CUE-10	T500	TP500
		CUE-10	LV100, LV101	TP103
9	BIAS CURRENT	CUE-10	RV500	TP105 (X), TP106 (G)
10	CUE OA (ROUGH)	CUE-10	CHECK	CUE
		CUE-10	RV100	TP100
11	CUE OA FREQ RESPONSE	CUE-10	CHECK	CUE
		CUE-10	RV103, LV102	TP100
12	CUE OA LEVEL	CUE-10	CHECK	CUE
		CUE-10	RV100	TP100
13	CUE OA DISTORTION RATIO	CUE-10	CHECK	CUE
14	LTC PB LEVEL	CUE-10	CHECK	TP402
15	LTC OA CHECK	CUE-10	CHECK	TP401, TC OUT, TP402
16	TC INS CROSSTALK	CUE-10	RV400, RV401	CUE
17	CUE ERASURE RATIO		CHECK	CUE
18	FULL ERASE ERASURE RATIO		CHECK	CUE

2. Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Audio generator (TEKTRONIX SG505-option 02 or equivalent)
- Audio analyzer (TEKTRONIX AA501A-option 02 or equivalent)

Note

Audio analyzer is filtered through 80 kHz L.P.F unless otherwise specified.

- Time code generator (SONY BVG-1500)
- Time code reader (SONY BVG-1600)
- Audio level meter
- Alignment tape HR5-1A (Part number 8-960-076-01)
- HDCAM blank cassette tape

Note

"Blank cassette tape" is indicated a cassette tape on which no video and audio signals are recorded.

3. Alignment Tape

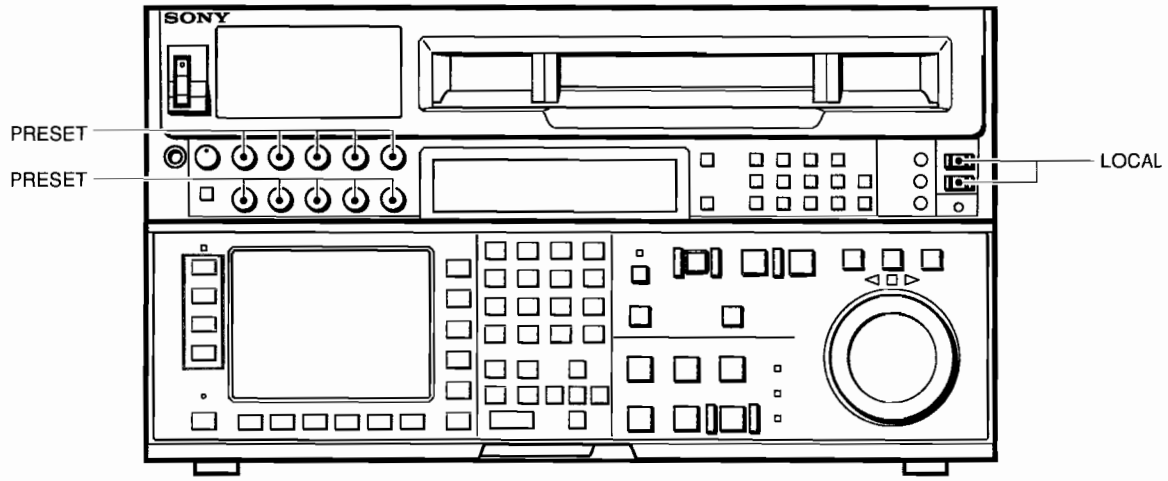
HR5-1A (for digital video system and audio system adjustments)
Part number 8-960-076-01

Contents

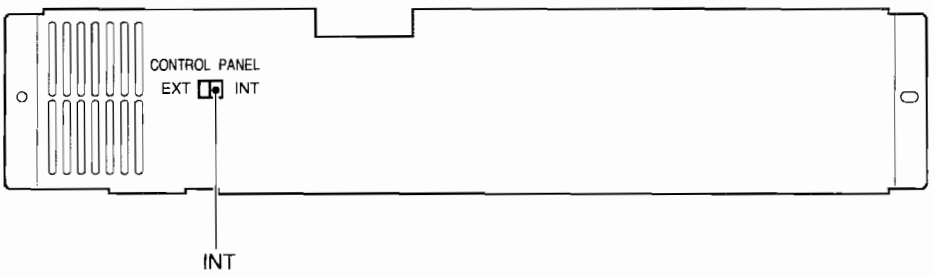
Time min. : sec.	CTL	VIDEO	D-AUDIO	CUE	Time min. : sec.
00 : 00	CTL	Color Bars (100 %)	1 kHz –20 dB FS	1 kHz 0 VU	00 : 00
				Blank	01 : 25
				1 kHz –20 VU	01 : 30
02 : 00			1 kHz 0 dB FS	Blank	02: 25
				3 kHz –20 VU	02 : 30
				Blank	02 : 55
				7 kHz –20 VU	03 : 00
				Blank	03 : 25
				10 kHz –20 VU	03 : 30
				Blank	03 : 55
04 : 00			–∞ dB FS	12 kHz –20 VU	04 : 00
				Blank	04 : 25
				90 Hz –20 VU	04 : 30
				Blank	04 : 55
				Repeat	05 : 00
06 : 00			20 Hz –20 dB FS		
08 : 00			20 kHz –20 dB FS		
10 : 00		Ramp	Repeat	Repeat	10 : 00
20 : 00		Multi Burst	—	—	20 : 00
30 : 00					30 : 00

4. Switch Settings

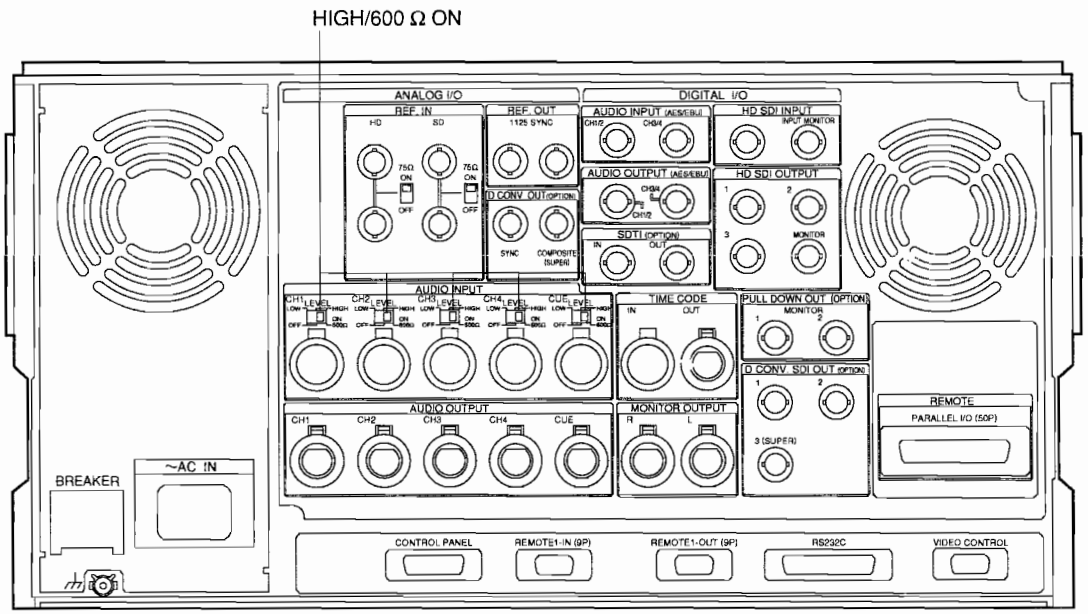
Upper control panel



Lower control panel (System setup panel)



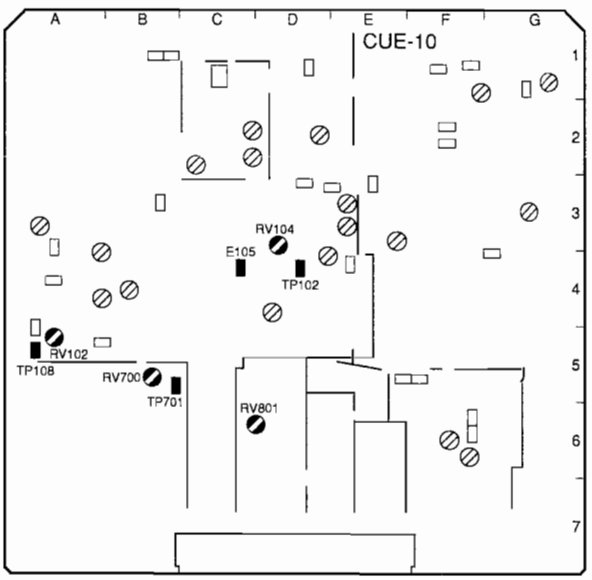
Connector panel



3-2-2. CUE INITIAL Adjustment

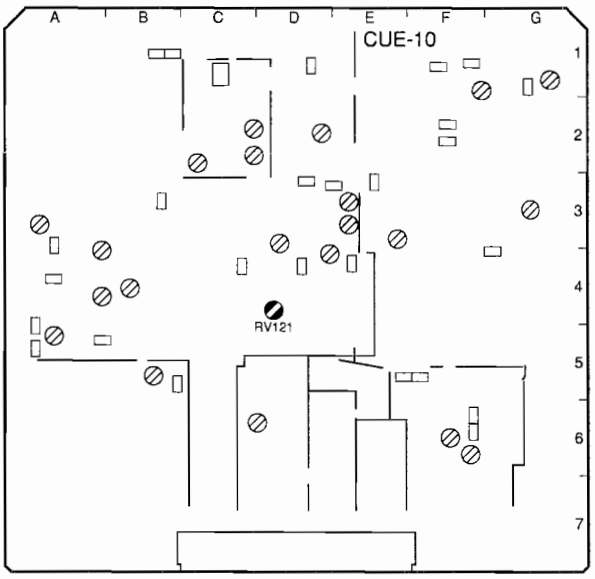
Preparations for adjustment	Specification	Adjustment
• Shorten between TP102 (D-4) and E105 (C-4) on the CUE-10 board by a shorting clip. • Supply 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. **Step 1 (EE UNITY)** • Connect the audio level meter to TP701 on the CUE-10 board.	Audio level meter TP701/CUE-10 (B-5) −1.0 ±0.2 dBu	(INPUT LEVEL ADJ) ⊘RV801/CUE-10 (D-6)
Step 2 (CUE OUT) • Measure the voltage of TP108 with digital voltmeter.	Digital voltmeter TP108/CUE-10 (A-5) 1.588 ±0.0010 mV	(CUE METER ADJ) ⊘RV102/CUE-10 (A-5)
Step 3 (CUE OUT) • Connect the audio analyzer to ANALOG AUDIO OUTPUT CUE connector.	Audio analyzer ANALOG AUDIO OUTPUT CUE +4.0 ±0.1 dBu (terminated by 600 Ω)	(CUE OUT ADJ) ⊘RV700/CUE-10 (B-5)
Step 4 (CUE DISTORTION) • Measure the distortion.	Audio analyzer ANALOG AUDIO OUTPUT CUE 0.1 % or less	(VCA DIST) ⊘RV104/CUE-10 (D-4)

• After adjustment, remove the short clip from TP102 and E105.



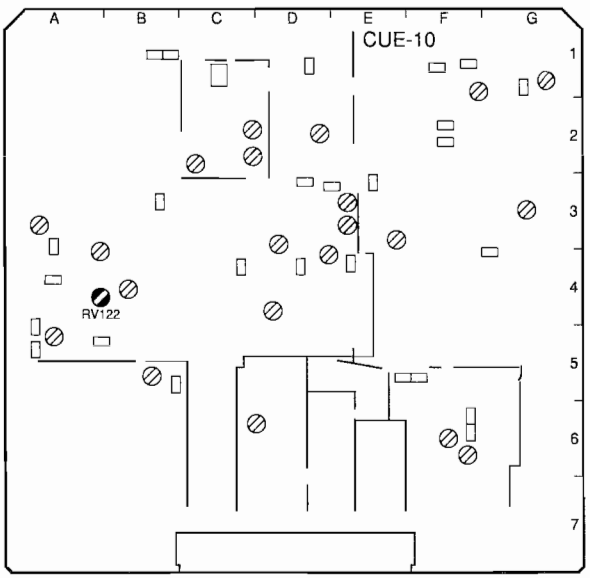
3-2-3. CUE UNITY Level Adjustment

Preparations for adjustment	Specification	Adjustment
• Supply 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel.	Audio analyzer ANALOG AUDIO OUTPUT CUE +4.0 ±0.1 dBu (terminated by 600 Ω)	⊘RV121/CUE-10 (D-4)



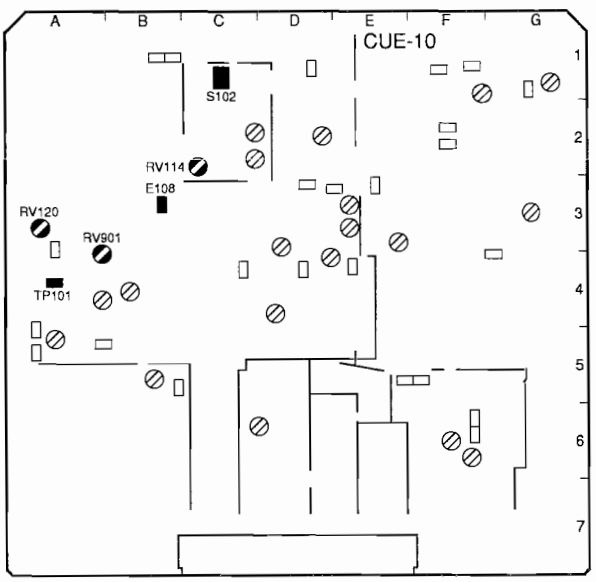
3-2-4. CUE Monitor Output Level Check

Preparations for adjustment	Specification	Adjustment
• Supply 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Select the CUE with MONITOR SELECT L/R.	Audio analyzer MONITOR OUTPUT L/R +4.0 ±0.1 dBu (terminated by 600 Ω)	◐RV122/CUE-10 (A-4)



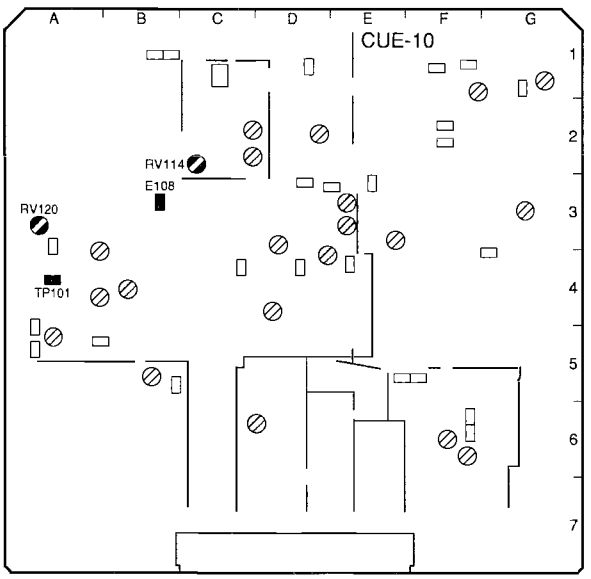
3-2-5. CUE PB Frequency Response Adjustment

<table>
<tr><th>Preparations for adjustment</th><th>Specification</th><th>Adjustment</th></tr>
<tr>
<td>• Play back the 1 kHz, 3 kHz, 7 kHz, 10 kHz, 12 kHz and 90 Hz (each –20 VU) signal portions (from 1 : 30 to 4 : 55) of an alignment tape HR5-1A.</td>
<td>ANALOG AUDIO OUTPUT CUE
<table>
<tr><th>Frequency [Hz]</th><th>Output level [dB]</th></tr>
<tr><td>1 k</td><td>0 (Reference)</td></tr>
<tr><td>3 k</td><td>0 ±0.5</td></tr>
<tr><td>7 k</td><td>0 ±0.5</td></tr>
<tr><td>10 k</td><td>0 ±0.5</td></tr>
<tr><td>12 k</td><td>–0.2 ±0.5</td></tr>
<tr><td>90</td><td>$0\ ^{+0.7}_{-1.7}$</td></tr>
</table>
Note Be sure to compensate the output level with the compensation value of an alignment tape.</td>
<td>◍RV901/CUE-10 (A-4)</td>
</tr>
</table>



3-2-6. CUE PB Level Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Shorten between TP101 (A-4) and E108 (B-3) of the CUE-10 board by a shorting clip. • Play back the 1 kHz/0 VU signal portion (from 0 : 00 to 1 : 25) of an alignment tape HR5-1A.	Audio analyzer ANALOG AUDIO OUTPUT CUE 4.0 ±0.1 dBu (terminated by 600 Ω)	(PB LEVEL ADJ) ●RV114/CUE-10 (C-2)
Step 2 • Remove the shorting clip. • Play back the 1 kHz/0 VU signal portion (from 0 : 00 to 1 : 25) of an alignment tape HR5-1A.	Audio analyzer ANALOG AUDIO OUTPUT CUE 4.0 ±0.1 dBu (terminated by 600 Ω)	(PB LEVEL ADJ) ●RV120/CUE-10 (A-3)

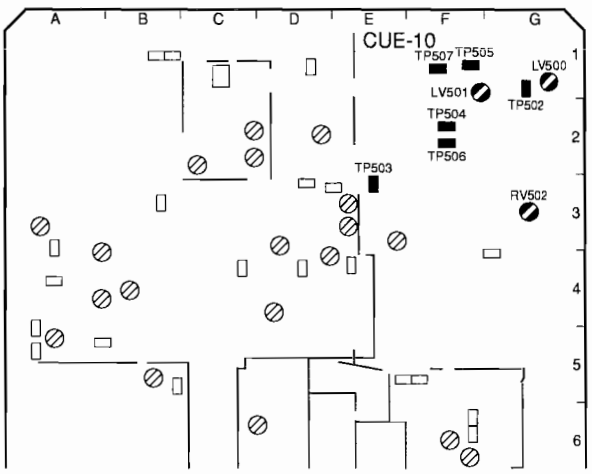


3-2-7. Full Erase Current Check

Preparations for adjustment	Specification	Adjustment
• Connect the audio level meter to TP505 (X) and TP502 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	Audio level meter TP506/CUE-10 (F-2) – TP503/CUE-10 (E-3) more than 120 mV	Check

3-2-8. Channel Erase Current Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the audio level meter to TP505 (X) and TP502 (G) of the CUE-10 board. • Load the HDCAM blank cassette tape and set the unit in REC mode.	Audio level meter TP505/CUE-10 (F-1) – TP502/CUE-10 (G-2) Maximize the level.	(CUE ERASE CURRENT ADJ) ⊘LV500/CUE-10 (G-1)
	Audio level meter TP505/CUE-10 (F-1) – TP502/CUE-10 (G-2) 160 ±5 mVrms	(CUE ERASE ADJ) ⊘RV502/CUE-10 (G-3)
• Disconnect the audio level meter and monitor the waveform at TP505 (X) and TP502 (G) by the oscilloscope.	Oscilloscope TP505/CUE-10 (F-1) – TP502/CUE-10 (G-2) Distortion is not be appeared.	Check
Step 2 • Connect the audio level meter to TP507 (X) and TP504 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	Audio level meter TP507/CUE-10 (F-1) – TP504/CUE-10 (F-2) Maximize the level. (more than 120 mVrms)	(LTC ERASE CURRENT ADJ) ⊘LV501/CUE-10 (F-1)
• Disconnect the audio level meter and monitor the waveform of TP507 (X) and TP504 (G) by the oscilloscope.	Oscilloscope TP507/CUE-10 (F-1) – TP504/CUE-10 (F-2) Distortion is not be appeared.	Check

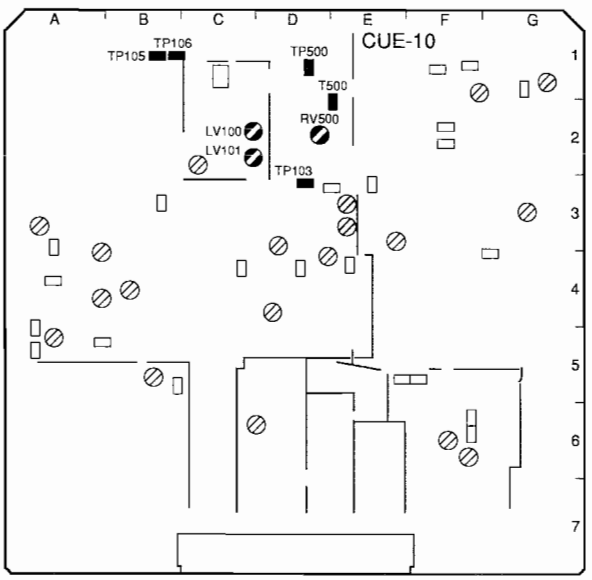


3-2-9. Bias Tune and Trap Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 · Connect the oscilloscope to TP500 on the CUE-10 board. · Insert an HDCAM blank cassette tape and select the REC mode.	TP500/CUE-10 (D-1) Maximize the level.	BIAS TUNE ⊘T500/CUE-10 (E-1)
Step 2 · Connect the oscilloscope to TP103 on the CUE-10 board. · Insert an HDCAM blank cassette tape and select the REC mode.	TP103/CUE-10 (D-3) Minimize the level. (The level is less than 10 dBu.) LV100 LV101 **Note** Turn LV100 and LV101 in parallel.	BIAS TRAP ⊘LV100/CUE-10 (C-2) ⊘LV101/CUE-10 (C-2)

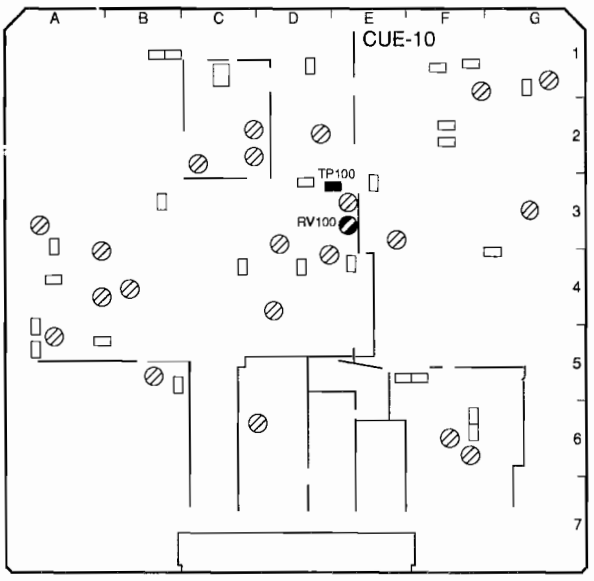
3-2-10. Bias Current Adjustment

Preparations for adjustment	Specification	Adjustment
· Connect the audio level meter to TP105 (X) and TP106 (G) on the CUE-10 board. · Insert an HDCAM blank cassette tape and select the REC mode.	Audio level meter TP105/CUE-10 (B-1) 16.0 ±0.5 mVrms	(BIAS CUR ADJ) ⊘RV500/CUE-10 (D-2)



3-2-11. CUE OA Level Rough-check

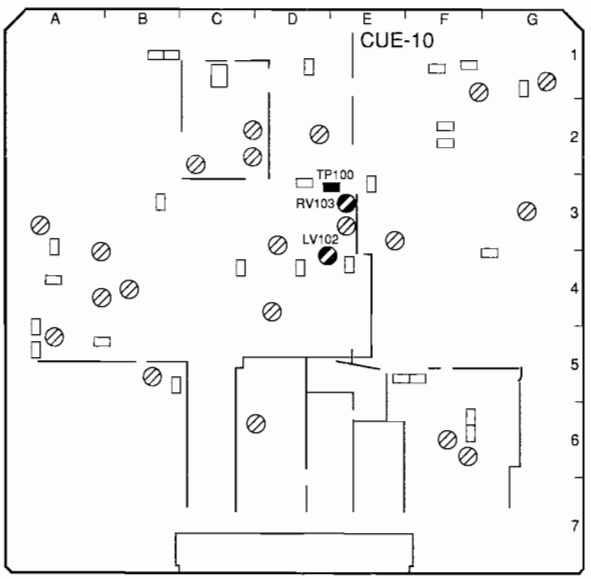
Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion. • The value of the CUE OUT value at this time is referred to as "value 1."	ANALOG AUDIO OUTPUT CUE +4.0 ±0.5 dBu (terminate with 600 Ω) Correction value = "value 1" – 4.0 If the correction value exceeds ±0.5 dB, carry out the step 2.	
Step 2 If the specification is not met, carry out the following steps. • Connect the audio level meter to TP100 on the CUE-10 board. • Select the REC mode. • The value of the audio level meter at this time is referred to as "value 2."	TP100/CUE-10 (E-3) Specification = "value 2" – correction value Adjust the level of TP100 to meet the specification and re-check the step 1.	REC LEVEL ADJ ⊘RV100/CUE-10 (E-3)



3-2-12. CUE OA Frequency Response Check

<table>
<tr><th>Preparations for adjustment</th><th>Specification</th><th>Adjustment</th></tr>
<tr><td>Step 1
• Insert an HDCAM blank cassette tape and record the 1 kHz, 10 kHz and 12 kHz (each −16 dBu) signals.
• Play back the recorded portion.
• The values CUE OUT at this time are referred to as "value 1 (1), (10) and (12) ."</td><td>ANALOG AUDIO OUTPUT CUE
<table><tr><th>Frequency [Hz]</th><th>Output level [dB]</th></tr><tr><td>1 k</td><td>0 (Reference)</td></tr><tr><td>10 k</td><td>0 ±0.7</td></tr><tr><td>12 k</td><td>0 ±0.7</td></tr></table>Correction values (10) and (12) = "value 1 (10) and (12)" – "value 1 (1)"
If the correction values exceed the specifications, carry out the step 2.</td><td></td></tr>
<tr><td>Step 2
If the specification is not met, carry out the following steps.
• Connect the audio level meter to TP100 on the CUE-10 board.
• Record the 10 kHz and 12 kHz (each −16 dBu) signals.
• The value of the level meter at this time are referred to as "value 2 (10) and (12) ."</td><td>TP100/CUE-10 (E-3)
value (10) = "value 2 (10)" – correction value (10)
value (12) = "value 2 (12)" – correction value (12)

Adjust the level of TP100 to meet each specification for each frequency and re-check the step 1.</td><td>10 kHz : ⊘RV103/CUE-10 (E-3)
12 kHz : ⊘LV102/CUE-10 (D-4)</td></tr>
</table>

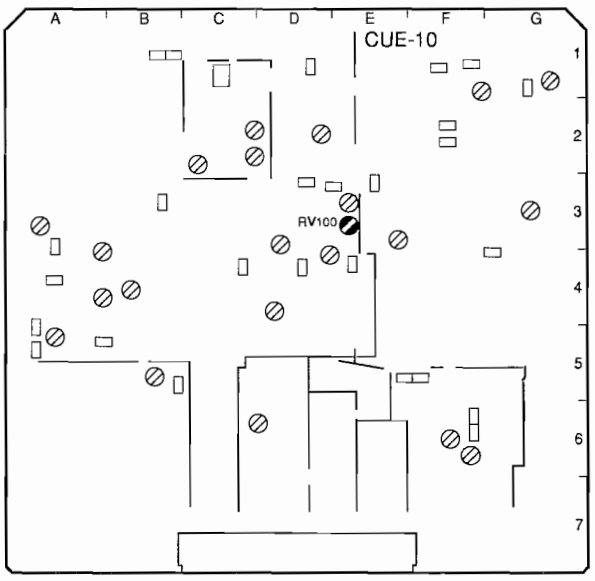


3-2-13. CUE OA Level Adjustment

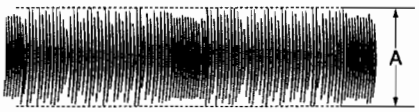
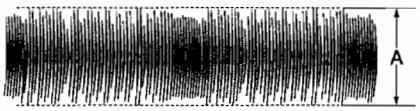
Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion.	ANALOG AUDIO OUTPUT CUE +4.0 ±0.2 dBu (terminate with 600 Ω)	⊘RV100/CUE-10 (E-3)

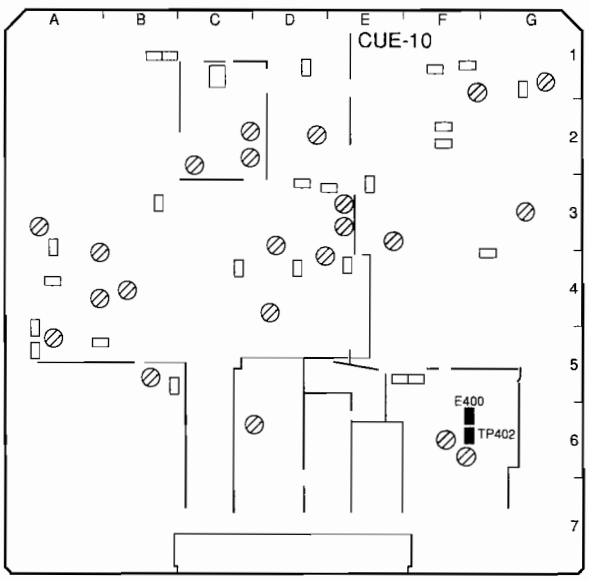
3-2-14. CUE OA Distortion Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz/+4.0 dBu signal (terminated by 600 Ω) to ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion.	ANALOG AUDIO OUTPUT CUE 2 % or less	Check

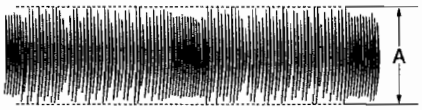


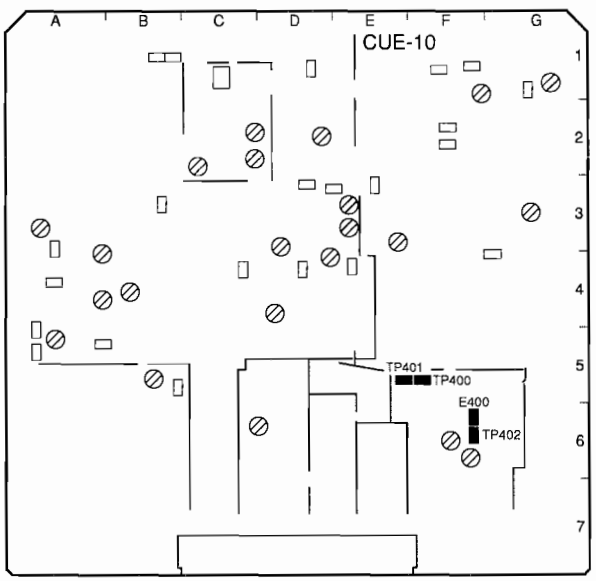
3-2-15. LTC PB Level Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the oscilloscope to TP402 (X) and E400 (G) on the CUE-10 board. • Play back an alignment tape HR5-1A.	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check
Step 2 a) REW b) REV shuttle × 5 c) REV shuttle × 1/5 Play back an alignment tape HR5-1A with the above tape speed.	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check (1) If the specification is not met, clean the head. (2) If the specification is not met after the step (1) is carried out, re-carry out "Section 6-1-10. CUE Level Check and Adjustment in REV Mode" and re-check from "Section 3-2-5. CUE PB Frequency Response Adjustment."



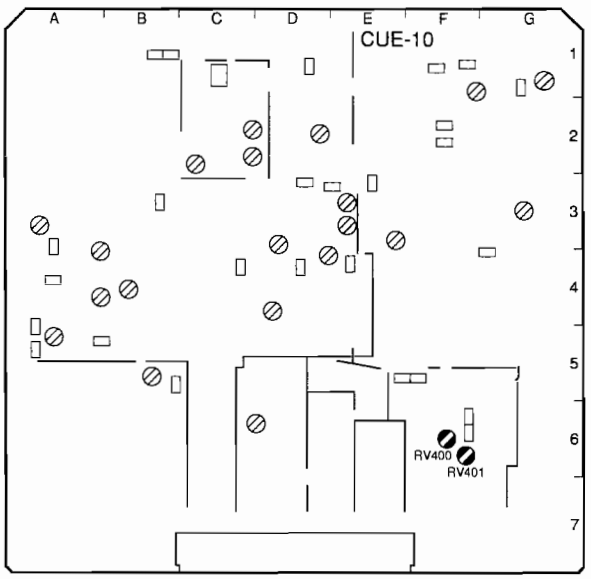
3-2-16. LTC OA Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the LTC OUT of the BVG-1600 to the TIME CODE IN connector on the connector panel. • Connect oscilloscope to TP400 (X) and TP401 (G) on the CUE-10 board. • Load the HDCAM blank cassette tape, and make a short recording.	TP401/CUE-10 (F-5) 60 ±5 mVp-p	Check
Step 2 • Connect the LTC IN of the BVG-1500 to the TIME CODE OUT connector on the connector panel. • Rewind the tape, which recorded in step 1, and play it back.	TIME CODE OUT The waveform can be monitored by the BVG-1500.	Check
Step 3 • Connect the oscilloscope to TP402 (X) and E400 (G) on the CUE-10 board. • Play back the recorded portion at the step 1 in the following four modes. a) PLAY b) REW c) REV shuttle × 5 d) REV shuttle × 1/5	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check



3-2-17. TC Insert Crosstalk Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply no signal to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion. • Press the INSERT TIME CODE button. • Press the EDIT botton after pressing the PLAY button.	ANALOG AUDIO OUTPUT CUE The level is be less than −18 dBu. (30 kHz LPF) Alternately adjust to meet the specification and to be minimum level.	⊘RV400/CUE-10 (F-6) ⊘RV401/CUE-10 (F-6)



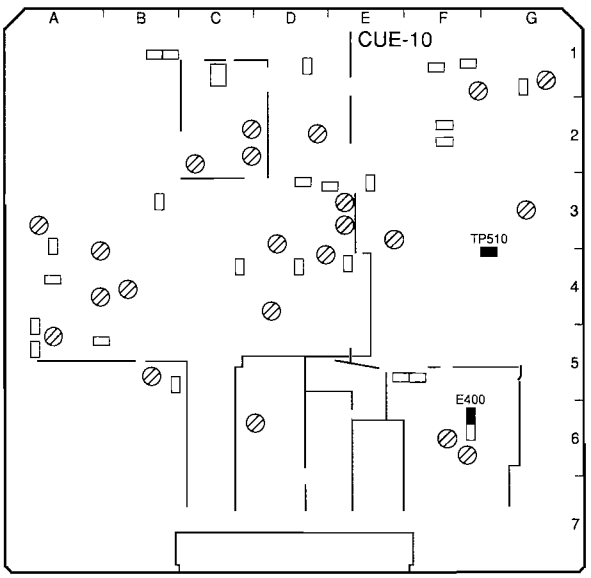
3-2-18. CUE Erasure Ratio Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz/+13.5 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Rewind half of the recorded portion. • Supply no signal the ANALOG AUDIO INPUT CUE connector on the connector panel. • Press the EDIT and PLAY buttons after pressing the INSERT CUE button. • Play back the recorded portion. • Measure the level of the ANALOG AUDIO OUTPUT CUE connector on the connector panel through the B.P.F (1 kHz).	ANALOG AUDIO OUTPUT CUE Level difference of signal portion and no signal portion more than 65 dB	Check (1) If the specification is not met, clean the head. (2) If the specification is not met after the step (1) is carried out, re-carry out "Section 6-1-8 AT Head Head-to-Tape Contact Check and Adjustment" and re-check from "Section 3-2-5. CUE PB Frequency Response Adjustment."

3-2-19. Full Erase Erasure Check

Preparations for adjustment	Specification	Adjustment
• Supply the 1 kHz/+13.5 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Rewind half of the recorded portion. • Supply no signal to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Shorten between TP510 (G-4) and E400 (F-6) on the CUE-10 board by a short clip. • Press the REC and PLAY buttons at the same time. • Play back the recorded portion. • Measure the level of the ANALOG AUDIO OUTPUT CUE connector on the connector panel through the B.P.F (1 kHz).	ANALOG AUDIO OUTPUT CUE Level difference of signal portion and no signal portion more than 40 dB	Check (1) If it is out of specification, perform head cleaning. (2) If the specification is not met after the step (1) is carried out, recheck from "Section 3-2-5. CUE PB Frequency Response Adjustment."

• After the adjustment, remove the short clip.



3-3. RF System Adjustment

3-3-1. Preparation

1. Item List

No.	Items		Board	Adjustment	Point
1	ADV PB Delay	(A/C CH)	EQ-85	RV300	TP701, TP303
		(B/D CH)	EQ-85	RV400	TP702, TP403
2	CNF PB Delay	(A/C CH)	EQ-85	RV500	TP801, TP503
		(B/D CH)	EQ-85	RV600	TP802, TP603
3	SAT ENV Gain	(8T)	EQ-85	RV201	TP1201 (SAT-ENV)/SS-88
		(80T)	EQ-85	RV200	TP1201 (SAT-ENV)/SS-88

2. Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Use the probes that has the same characteristics each of CH-1 and CH-2.

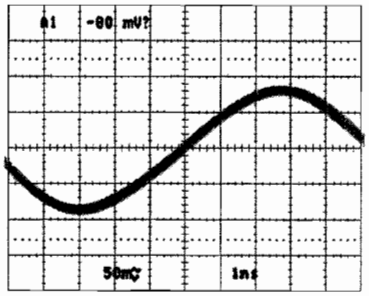
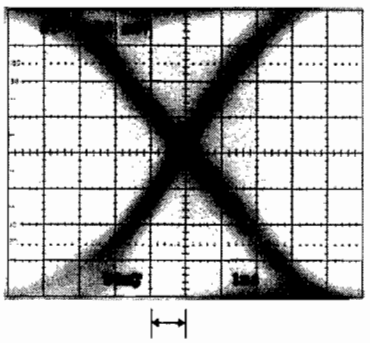
3. Preparetions Before Adjustment

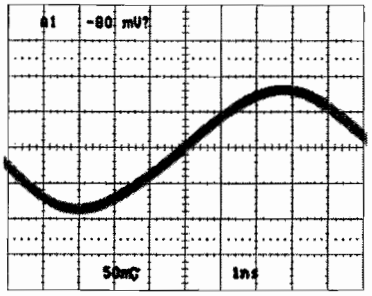
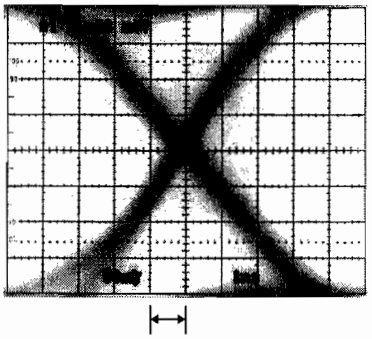
Extend the EQ-85 board with extension card EX-579.

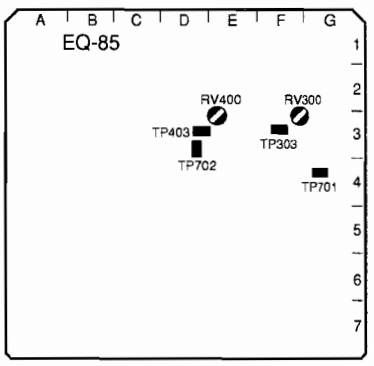
3-3-2. ADV PB Delay Adjustment

When RV300, RV400, IC300, IC400, IC700 or IC701 has been replaced, perform the following adjustment.

- Select the menu in the following order:
  MAINTENANCE MENU→[F 8] : A/V CHECK→[F 8] : SYSTEM EE→SYSTEM EE6

Preparations for adjustment	Specification	Adjustment
Step 1 • Set RV701 maximum clockwise position. • Connect CH2 of the oscilloscope to TP701. • Set the oscilloscope to GND mode, and move the bright line to the center of the screen with VERTICAL POSITION control. • Set the oscilloscope to AC mode, and move the bright line to the center of the screen with HORIZONTAL POSITION control as shown in Fig. 1. • Connect CH1 of oscilloscope to TP303.	TP701/EQ-85 (G-4) Fig. 1  TP303/EQ-85 (F-3) Fig. 2 	⊘RV300/EQ-85 (F-3)
TRIGGER : CH2 + Setting the CH1 of oscilloscope COUPLING : AC V : 50 mV/DIV H : 1 nsec/DIV Setting the CH2 of oscilloscope COUPLING : AC V : 50 mV/DIV	• Adjust RV300 so that the cross point of the bright lines comes in between the center of screen and the one scale of left side as shown in Fig. 2.	

Preparations for adjustment	Specification	Adjustment
Step 2 • Set RV702 maximum clockwise position. • Connect CH2 of the oscilloscope to TP702. • Set the oscilloscope to GND mode, and move the bright line to the center of the screen with VERTICAL POSITION control. • Set the oscilloscope to AC mode, and move the bright line to the center of the screen with HORIZONTAL POSITION control as shown in Fig. 1. • Connect CH1 of oscilloscope to TP403.	TP702/EQ-85 (D-4) Fig. 1 	
	TP403/EQ-85 (D-3)	⊘RV400/EQ-85 (E-3)
TRIGGER : CH2 + Setting the CH1 of oscilloscope COUPLING : AC V : 50 mV/DIV H : 1 nsec/DIV Setting the CH2 of oscilloscope COUPLING : AC V : 50 mV/DIV	Fig. 2  • Adjust RV400 so that the cross point of the bright lines comes in between the center of screen and the one scale of left side as shown in Fig. 2.	

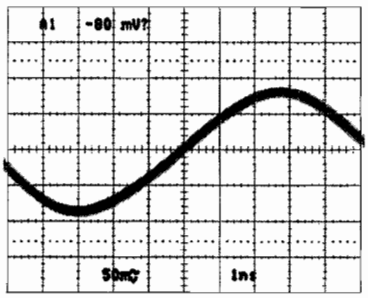
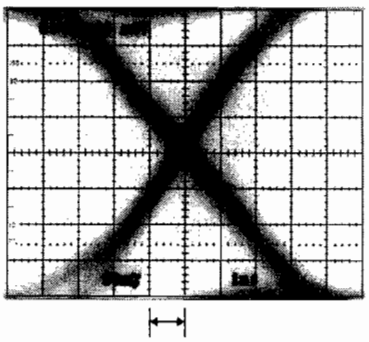


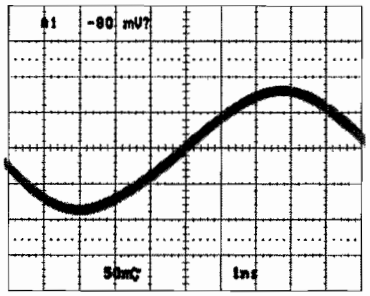
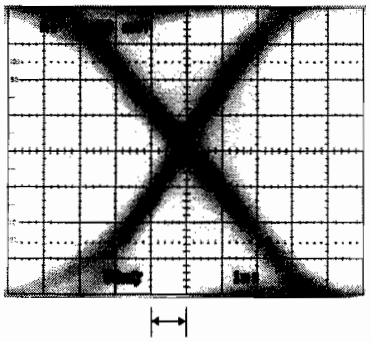
EQ-85 Board (A side)

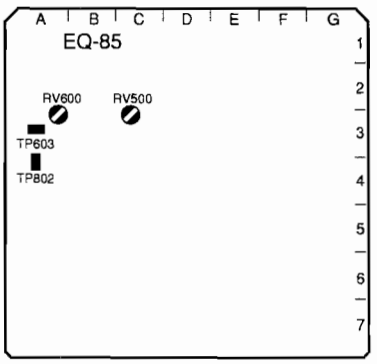
3-3-3. CNF PB Delay Adjustment

When RV500, IC600, IC500, IC600, IC800 or IC801 has been replaced, perform the following adjustment.

- Select the menu in the following order:
  MAINTENANCE MENU→[F 8] : A/V CHECK→[F 8] : SYSTEM EE→SYSTEM EE7

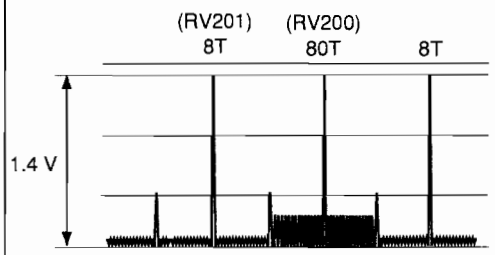
Preparations for adjustment	Specification	Adjustment
Step 1 • Set RV801 maximum clockwise position. • Connect CH2 of the oscilloscope to TP801. • Set the oscilloscope to GND mode, and move the bright line to the center of the screen with VERTICAL POSITION control. • Set the oscilloscope to AC mode, and move the bright line to the center of the screen with HORIZONTAL POSITION control as shown in Fig. 1. • Connect CH1 of oscilloscope to TP503.	TP801/EQ-85 (C-4) Fig. 1 	
	TP503/EQ-85 (B-3)	⊘RV500/EQ-85 (C-3)
TRIGGER : CH2 + Setting the CH1 of oscilloscope COUPLING : AC V : 50 mV/DIV H : 1 nsec/DIV Setting the CH2 of oscilloscope COUPLING : AC V : 50 mV/DIV	Fig. 2  • Adjust RV500 so that the cross point of the bright lines comes in between the center of screen and the one scale of left side as shown in Fig. 2.	

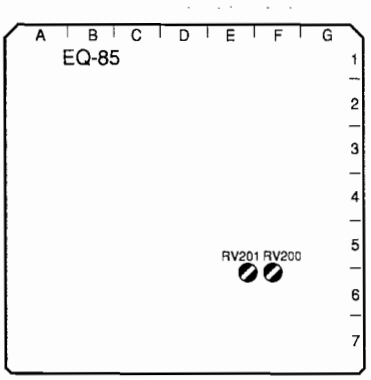
Preparations for adjustment	Specification	Adjustment
Step 2 • Set RV802 maximum clockwise position. • Connect CH2 of the oscilloscope to TP802. • Set the oscilloscope to GND mode, and move the bright line to the center of the screen with VERTICAL POSITION control. • Set the oscilloscope to AC mode, and move the bright line to the center of the screen with HORIZONTAL POSITION control as shown in Fig. 1. • Connect CH1 of oscilloscope to TP603.	TP802/EQ-85 (A-4) Fig. 1  TP603/EQ-85 (A-3) Fig. 2  • Adjust RV600 so that the cross point of the bright lines comes in between the center of screen and the one scale of left side as shown in Fig. 2.	⊘RV600/EQ-85 (A-3)
TRIGGER : CH2 + Setting the CH1 of oscilloscope COUPLING : AC V : 50 mV/DIV H : 1 nsec/DIV Setting the CH2 of oscilloscope COUPLING : AC V : 50 mV/DIV		



EQ-85 Board (A side)

3-3-4. SAT ENV Gain Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect CH1 of the oscilloscope to TP1201 on the SS-88 board. • Set the oscilloscope to GND mode, and move the bright line to the center of the screen with VERTICAL POSITION control. Setting the CH1 of oscilloscope COUPLING : DC V : 500 mV/DIV H : 2 msec/DIV TRIGGER : TP1110 +/SS-88 COUPLING : DC V : 2 V/DC	TP1201 (SAT ENV)/SS-75 (E-1) • Set the frame frequency of the unit to 23.98 Hz, and playback the alignment tape HR5-1A. • Set the oscilloscope to DC mode, and adjust RV201 so that SAT 8T portion becomes 1.4 V. • Set the oscilloscope to DC mode, and adjust RV200 so that SAT 80T portion becomes 1.4 V. 	⊘RV201/EQ-85 (F-5) ⊘RV200/EQ-85 (F-5)



EQ-85 Board (A side)

3-4. Digital Video System Adjustment

3-4-1. Preparation

1. Item List

No.	Items	Board	Adjustment	Point
1	INT 74 MHz FREQ (59.94)	DPR-143	RV3300	TP3300
2	INT 74 MHz FREQ (60)	DPR-143	RV3301	TP3301

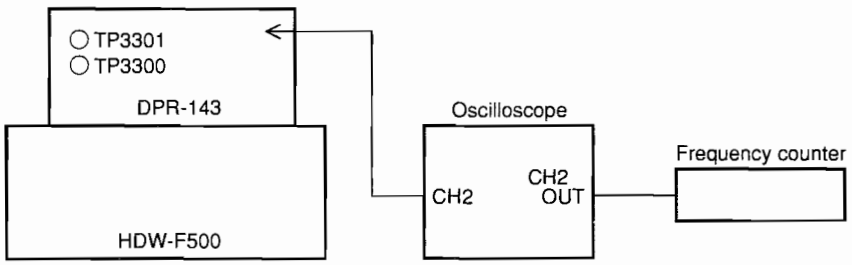
2. Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Frequency counter (ADVANTEST TR5821AK or equivalent)

3. Preparation Before Adjustment

(1) Extend the DPR-143 board with extension board EX-596.
(2) Take a warmup about 10 minutes before launching the adjustment.

4. Connection



3-4-2. INT 74 MHz Frequency Adjustment (59.94)

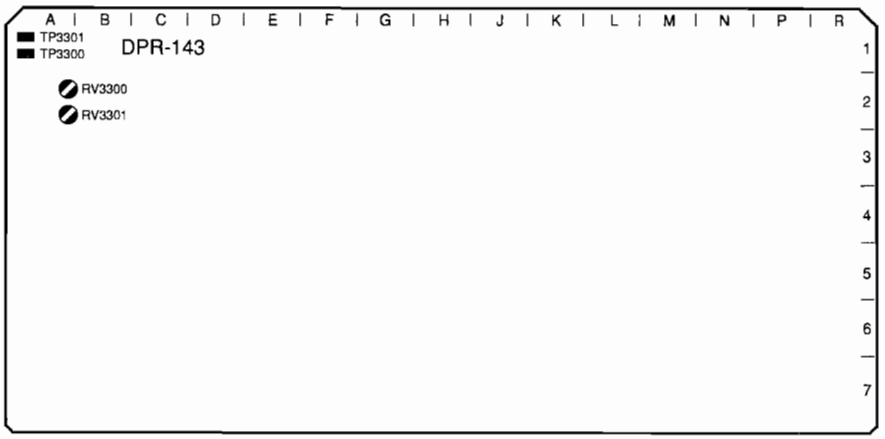
When IC3302, IC3304 or X3303 had been replace, perform the following adjustment.

Preparations for adjustment	Specification	Adjustment
• Connection 2 • No signals are input to the REF IN, HD SDI INPUT and DUB IN connectors. • Connect the oscilloscope TP3300.	Frequency counter TP3300/DPR-143 (A-1) 74.1758 ±0.0001 MHz	⊘RV3300/DPR-143 (A-2)

3-4-3. INT 74 MHz Frequency Adjustment (60)

When IC3302, IC3304 or X3304 had been replaced, perform the following adjustment.

Preparations for adjustment	Specification	Adjustment
• Connection 2 • No signals are input to the REF IN, HD SDI INPUT and DUB IN connectors. • Connect the oscilloscope TP3301.	Frequency counter TP3301/DPR-143 (A-1) 74.2500 ±0.0001 MHz	⊘RV3301/DPR-143 (A-2)



DPR-143 Board (A side)

3-5. Digital Audio System Adjustment

3-5-1. Preparation

1. Item List

No.	Item	Board	Adjustment	Point
1	TEST SG OUTPUT LEVEL	APR-49	RV500	CH1
		APR-49	RV600	CH2
		APR-49	RV700	CH3
		APR-49	RV800	CH4
		APR-49	RV900	MON L
		APR-49	RV920	MON R
2	A/D, D/A OUTPUT	APR-49	RV100	CH1
		APR-49	RV200	CH2
		APR-49	RV300	CH3
		APR-49	RV400	CH4
3	CUE MONITOR OUTPUT	APR-49	RV1400	MON L
		APR-49	RV1401	MON R

2. Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Audio generator (TEKTRONIX SG505-option 02 or equivalent)
- Audio analyzer (TEKTRONIX AA501A-option 02 or equivalent)

Note

Audio analyzer is filtered through 30 kHz L.P.F unless otherwise specified.

3. Preparation Before Adjustment

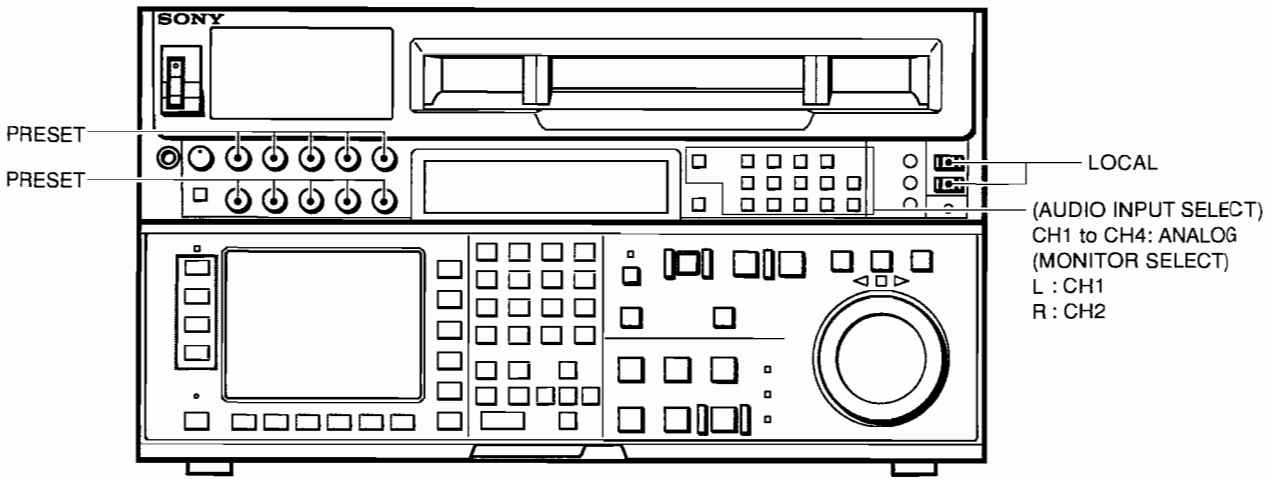
Extend the APR-49 board with extension board EX-596.

VTR SET UP menu
- 001 : PREREAD : OFF
- 002 : REC INH : OFF
- 109 : KEY INH : OFF
- 806 : EMPHASIS : OFF
- 812 : AU 3/4 INP : SW/SW

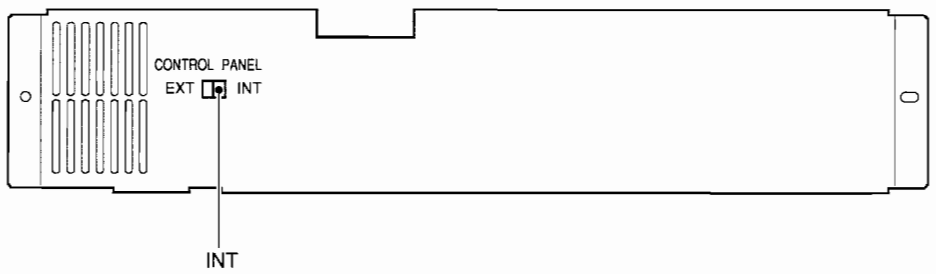
TC menu
- TIMER SEL : TC
- TCR SEL : LTC
- TCG MODE : PRST
- RUN MODE : REC
- TCG SOURCE : INT-L

4. Switch Settings

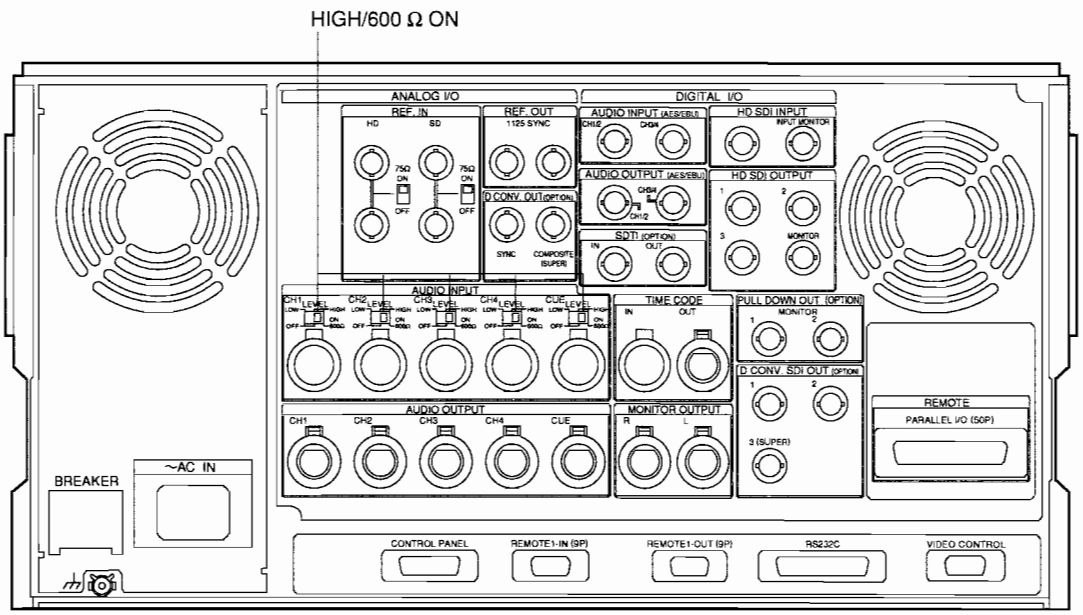
Upper control panel



Lower control panel (System setup panel)

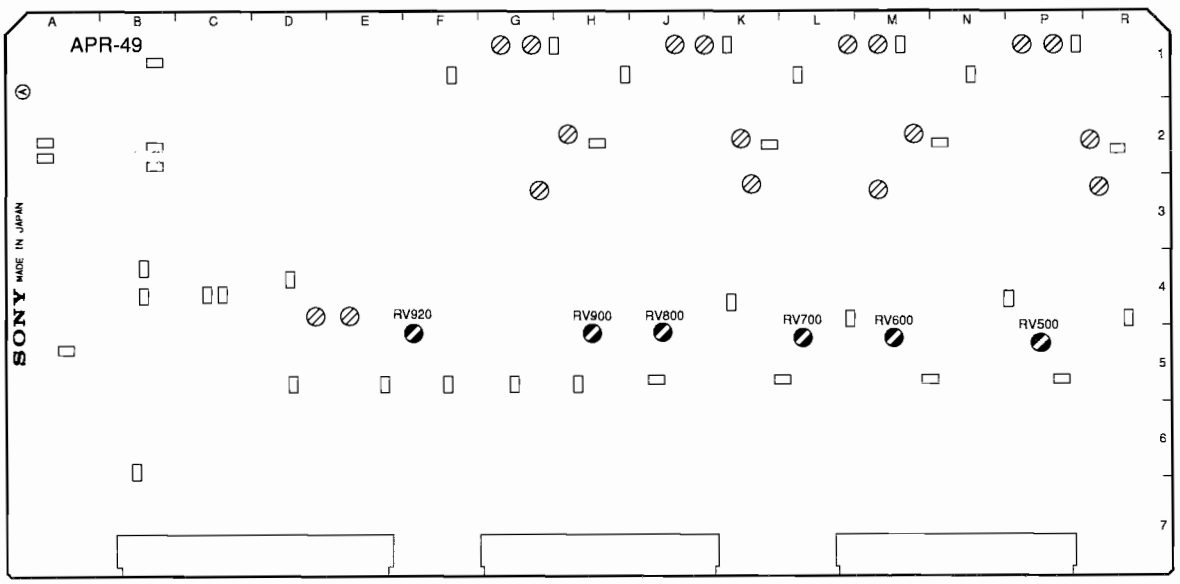


Connector panel



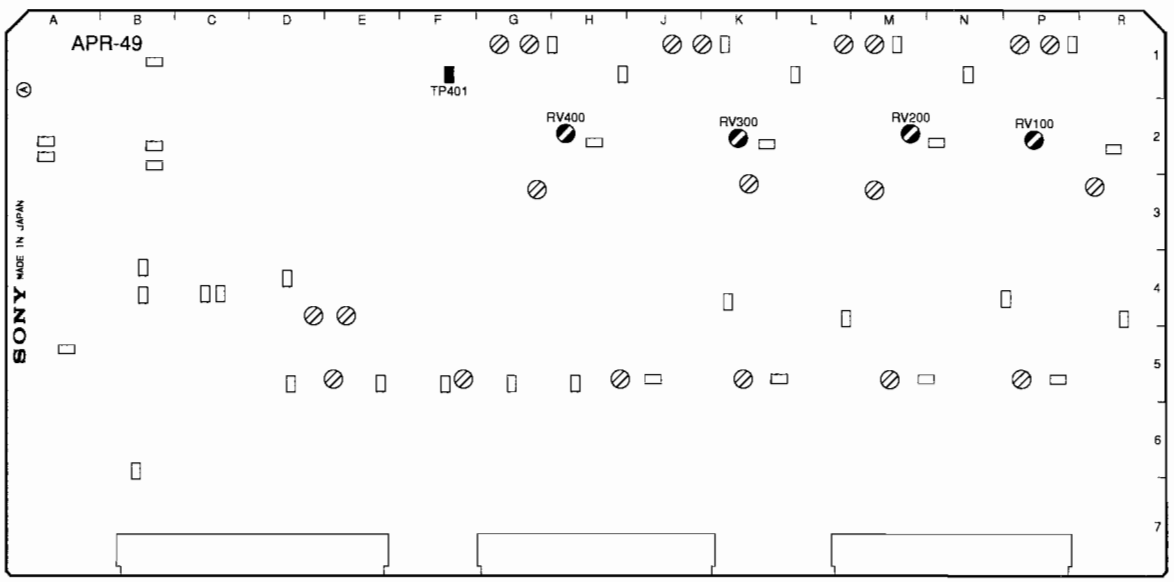
3-5-2. D/A Output and Monitor Output Level Adjustment

Preparations for adjustment	Specification	Adjustment
• SET UP menu Select T04 :1 kHz sine 0 VU • Connect the audio analyzer to CH1 to CH4 of ANALOG AUDIO OUTPUT and MONITOR L/R in sequence.	Audio analyzer ANALOG AUDIO OUTPUT CH1 through CH4, MONITOR L/R +4.0 ±0.1 dBu (terminate with 600 Ω)	CH1 : ⊘RV500/APR-49 (P-5) CH2 : ⊘RV600/APR-49 (M-5) CH3 : ⊘RV700/APR-49 (L-5) CH4 : ⊘RV800/APR-49 (J-5) MON L : ⊘RV900/APR-49 (H-5) MON R: ⊘RV920/APR-49 (F-5)



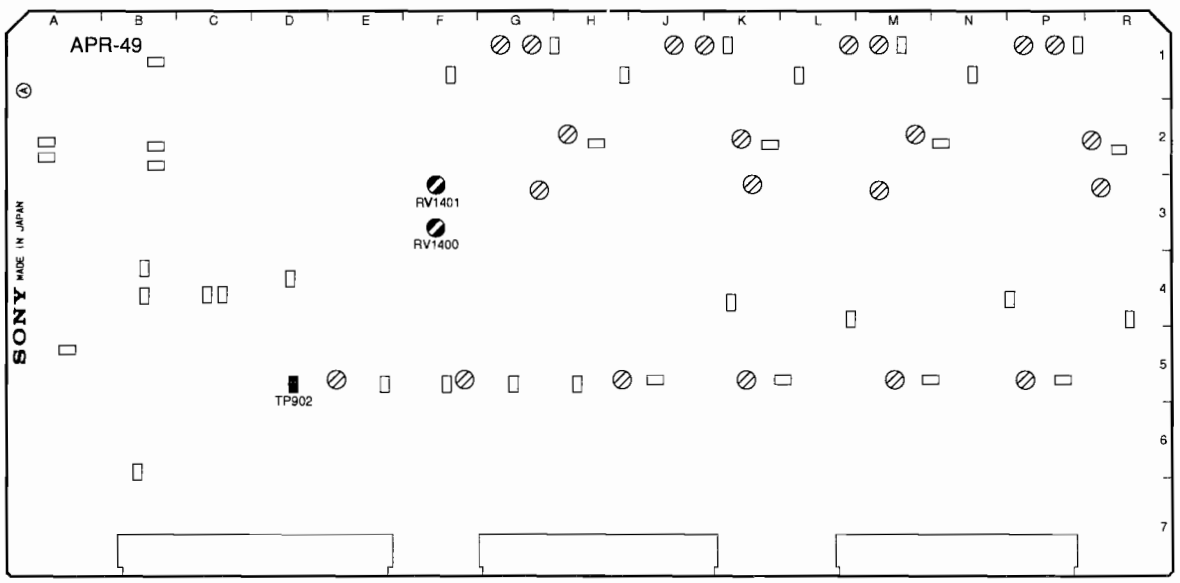
3-5-3. A/D and D/A Output Level Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply 1 kHz/+4.0 ±0.1 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CH1 connector. • Connect the audio analyzer to ANALOG AUDIO OUTPUT CH1 connector.	Audio analyzer ANALOG AUDIO OUTPUT CH1 +4.0 ±0.1 dBu (terminated by 600 Ω)	⊘RV100/APR-49 (P-2)
Step 2 • Supply 1 kHz/+4.0 ±0.1 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CH2 connector. • Connect the audio analyzer to ANALOG AUDIO OUTPUT CH2 connector.	Audio analyzer ANALOG AUDIO OUTPUT CH2 +4.0 ±0.1 dBu (terminated by 600 Ω)	⊘RV200/APR-49 (M-2)
Step 3 • Supply 1 kHz/+4.0 ±0.1 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CH3 connector. • Connect the audio analyzer to ANALOG AUDIO OUTPUT CH3 connector.	Audio analyzer ANALOG AUDIO OUTPUT CH3 +4.0 ±0.1 dBu (terminated by 600 Ω)	⊘RV300/APR-49 (K-2)
Step 4 • Supply 1 kHz/+4.0 ±0.1 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CH4 connector. • Connect the audio analyzer to ANALOG AUDIO OUTPUT CH4 connector.	Audio analyzer ANALOG AUDIO OUTPUT CH4 +4.0 ±0.1 dBu (terminated by 600 Ω)	⊘RV400/APR-49 (H-2)



3-5-4. CUE Monitor Output Level Adjustment

Preparations for adjustment	Specification	Adjustment
• Supply 1 kHz/+4.0 ±0.1 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector. . Select the CUE with MONITOR SELECT L/R. • Connect the audio analyzer to MONITOR OUTPUT L/R.	Audio analyzer MONITOR OUTPUT L/R +4.0 ±0.1 dBu (terminated by 600 Ω)	MONITORL : ⊘RV1400/APR-49 (F-3) MONITOR R : ⊘RV1401/APR-49 (F-3)



Section 4
Electrical Alignment (for Option Board)

4-1. HKDV-501A (DCP-26 Board)

4-1-1. Preparation

Note

Take a warmup about 10 minutes before launching the adjustment.

1. Item List

No.	Item		Board	Adjustment	Point
1	D1 SDI FREE RUN frequency	(CH1)	DCP-26	RV800	TP800
		(CH2)	DCP-26	RV803	TP801
		(CH3)	DCP-26	RV806	TP802
2	D2 SDI (525) FREE RUN frequency	(CH1)	DCP-26	RV802	TP800
		(CH2)	DCP-26	RV805	TP801
		(CH3)	DCP-26	RV808	TP802
3	Analog composite output (525)	(pedestal)	DCP-26	RV401	COMPOSITE
	/SYNC output (525)	(100 % video)	DCP-26	RV400	COMPOSITE
		(pedestal)	DCP-26	RV403	SD SYNC
		(SYNC/burst)	DCP-26	RV402	SD SYNC
4	Analog composite output (625)	(pedestal)	DCP-26	RV405	COMPOSITE
	/SYNC output (625)	(100 % video)	DCP-26	RV404	COMPOSITE
		(pedestal)	DCP-26	RV407	SD SYNC
		(SYNC/burst)	DCP-26	RV406	SD SYNC

2. Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Frequency counter (ADVANTEST TR5821AK or equivalent)
- 75 Ω terminator

4-1-2. D1 SDI FREE RUN Frequency Adjustment

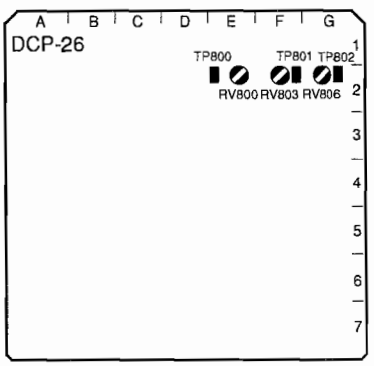
D1 Mode Setting

1. Set the unit in the maintenance menu.
   (1) Maintenance information will be displayed by pushing the MAINTENANCE swich with tip of a mechanical pencil, etc.
   (2) To enter the maintenance mode menu, press [F 8] (MAINTE EXEC) key while pressing [S F T] (shift) key.
2. To enter into the OTHERS CHECK screen, Press [F 9] (OTHERS CHECK) key.
3. Press [F 2] (SYSTEM FRQ) key, and select 59.94.
4. Press [F 3] (D-CONV SDI) key, and select D1.
5. Press [F 9] (EXEC) key. Since confiamation message appears, press [F 9] (EXEC) key again if it is OK. Initialization of the system will be started.
6. Turn the power off, then on again.

SDI PLL Adjust Setting

1. Set the unit in the maintenance menu.
2. To enter into the alternative maintenance menu, press [A L T] key.
3. To enter into the DOWN CONVERTER ADJUST menu, press [F 6] (DWNCVT ADJ) key.
4. Press [F 1] (SDI PLL) key.
5. Press [∧]/[∨] key to select "on."

Preparations for adjustment	Specification	Adjustment
• Connect the frequency counter to TP800 (FRUN1).	Frequency counter TP800 (FRUN1)/DCP-26 (E-2) 27.0 ±0.1 MHz	⊘RV801 (D1CK1)/ DCP-26 (E-2)
• Connect the frequency counter to TP801 (FRUN2).	Frequency counter TP801 (FRUN2)/DCP-26 (F-2) 27.0 ±0.1 MHz	⊘RV803 (D1CK2)/ DCP-26 (F-2)
• Connect the frequency counter to TP802 (FRUN3).	Frequency counter TP802 (FRUN3)/DCP-26 (G-2) 27.0 ±0.1 MHz	⊘RV806 (D1CK3)/ DCP-26 (G-2)



DCP-26 Board (A side)

4-1-3. D2 SDI FREE RUN Frequency Adjustment

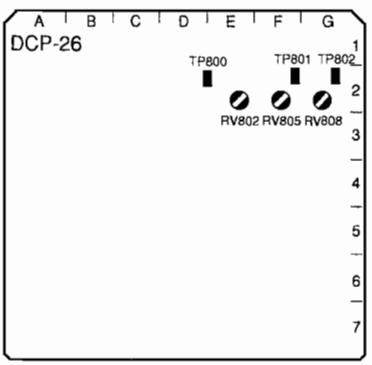
D2 Mode Setting

1. Set the unit in the maintenance menu.
2. To enter into the OTHERS CHECK screen, Press [F 9] (OTHERS CHECK) key.
3. Press [F 2] (SYSTEM FRQ) key, and select 59.94.
4. Press [F 3] (D-CONV SDI) key, and select D2.
5. Press [F 9] (EXEC) key. Since confiamation message appears, press [F 9] (EXEC) key again if it is OK. Initialization of the system will be started.
6. Turn the power off, then on again.

SDI PLL Adjust Setting

1. Set the unit in the maintenance menu.
2. To enter into the alternative maintenance menu, press [A L T] key.
3. To enter into the DOWN CONVERTER ADJUST menu, press [F 6] (DWNCVT ADJ) key.
4. Press [F 1] (SDI PLL) key.
5. Press [^]/[v] key to select "on."

Preparations for adjustment	Specification	Adjustment
• Connect the frequency counter to TP800 (FRUN1).	Frequency counter TP800 (FRUN1)/DCP-26 (E-2) 14.3 ±0.1 MHz	⊘RV802 (D2NCK1)/ DCP-26 (E-2)
• Connect the frequency counter to TP801 (FRUN2)	Frequency counter TP801 (FRUN2)/DCP-26 (F-2) 14.3 ±0.1 MHz	⊘RV805 (D2NCK2)/ DCP-26 (F-2)
• Connect the frequency counter to TP802 (FRUN3)	Frequency counter TP802 (FRUN3)/DCP-26 (G-2) 14.3 ±0.1 MHz	⊘RV808 (D2NCK3)/ DCP-26 (G-2)

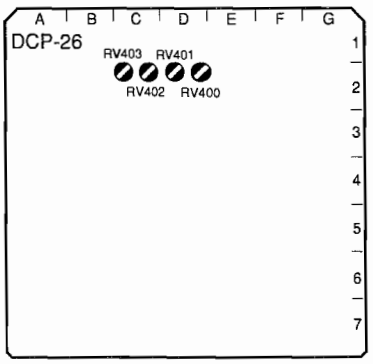


DCP-26 Board (A side)

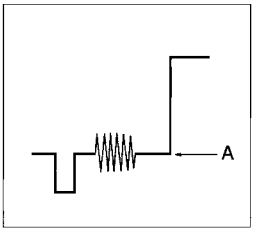
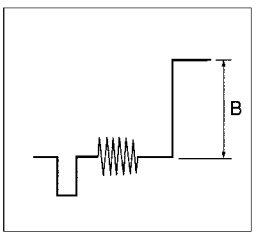
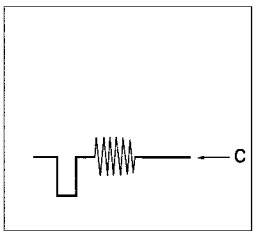
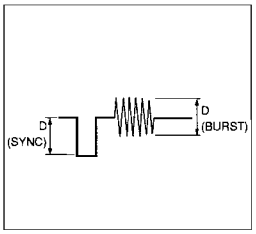
4-1-4. Analog Composite Output/SYNC Output (525) Level Adjustment

VIDEO LEVEL Adjust Setting

1. Set the unit in the maintenance menu.
2. To enter into the alternative maintenance menu, press [ALT] key.
3. Press [F6] (DWNCVT ADJ) key to enter into the DOWN CONVERTER ADJUST menu.
4. Press [F2] (VIDEO LEVEL) key.
5. Press [^]/[v] key to select "on."



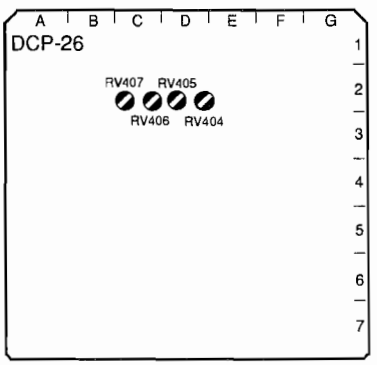
DCP-26 Board (A side)

Preparations for adjustment	Specification	Adjustments
Step 1 Plug the 75 Ω terminator into D CONV.OUT/ COMPOSITE connector, and connect the oscilloscope.	Oscilloscope Pedestal level ANALOG D CONV.OUT COMPOSITE connector  A = 0 ±5 mV Oscilloscope 100 % video level ANALOG D CONV.OUT COMPOSITE connector  B = 714 ±7 mV	⊘RV401 (VZN)/DCP-26 (D-2) ⊘RV400 (VGN)/DCP-26 (D-2)
Step 2 Plug the 75 Ω terminator into D CONV.OUT/ SD SYNC connector, and connect the oscilloscope.	Oscilloscope Pedestal level ANALOG D CONV.OUT SD SYNC connector  C = 0 ±5 mV Oscilloscope SYNC/Burst level ANALOG D CONV.OUT SD SYNC connector  D = 286 ±5 mV	⊘RV403 (BBZN)/DCP-26 (C-2) ⊘RV402 (BBGN)/DCP-26 (C-2)

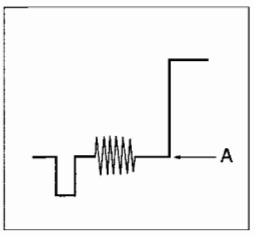
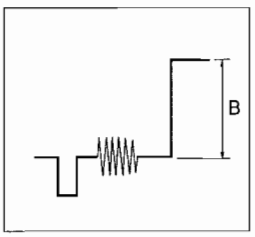
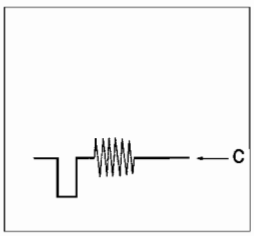
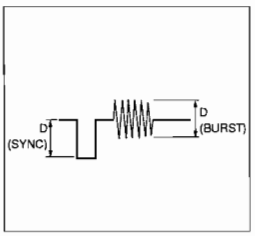
4-1-5. Analog Composite Output/SYNC Output (625) Level Adjustment

VIDEO LEVEL Adjust Setting

1. Set the unit in the maintenance menu.
2. To enter into the alternative maintenance menu, press [ALT] key.
3. Press [F6] (DWNCVT ADJ) key to enter into the DOWN CONVERTER ADJUST menu.
4. Press [F2] (VIDEO LEVEL) key.
5. Press [∧]/[∨] key to select "on."



DCP-26 Board (A side)

Preparations for adjustment	Specification	Adjustments
Step 1 Plug the 75 Ω terminator into D CONV.OUT/ COMPOSITE connector, and connect the oscilloscope.	Oscilloscope Pedestal level ANALOG D CONV.OUT COMPOSITE connector  A = 0 ±5 mV Oscilloscope 100 % video level ANALOG D CONV.OUT COMPOSITE connector  B = 700 ±7 mV	⊘RV405 (VZP)/DCP-26 (D-2) ⊘RV404 (VGP)/DCP-26 (D-2)
Step 2 Plug the 75 Ω terminator into D CONV.OUT/ SD SYNC connector, and connect the oscilloscope.	Oscilloscope Pedestal level ANALOG D CONV.OUT SD SYNC connector  C = 0 ±5 mV Oscilloscope SYNC/Burst level ANALOG D CONV.OUT SD SYNC connector  D = 300 ±5 mV	⊘RV407 (BBZP)/DCP-26 (C-2) ⊘RV406 (BBGP)/DCP-26 (C-2)

Section 5
Replacement of Main Parts

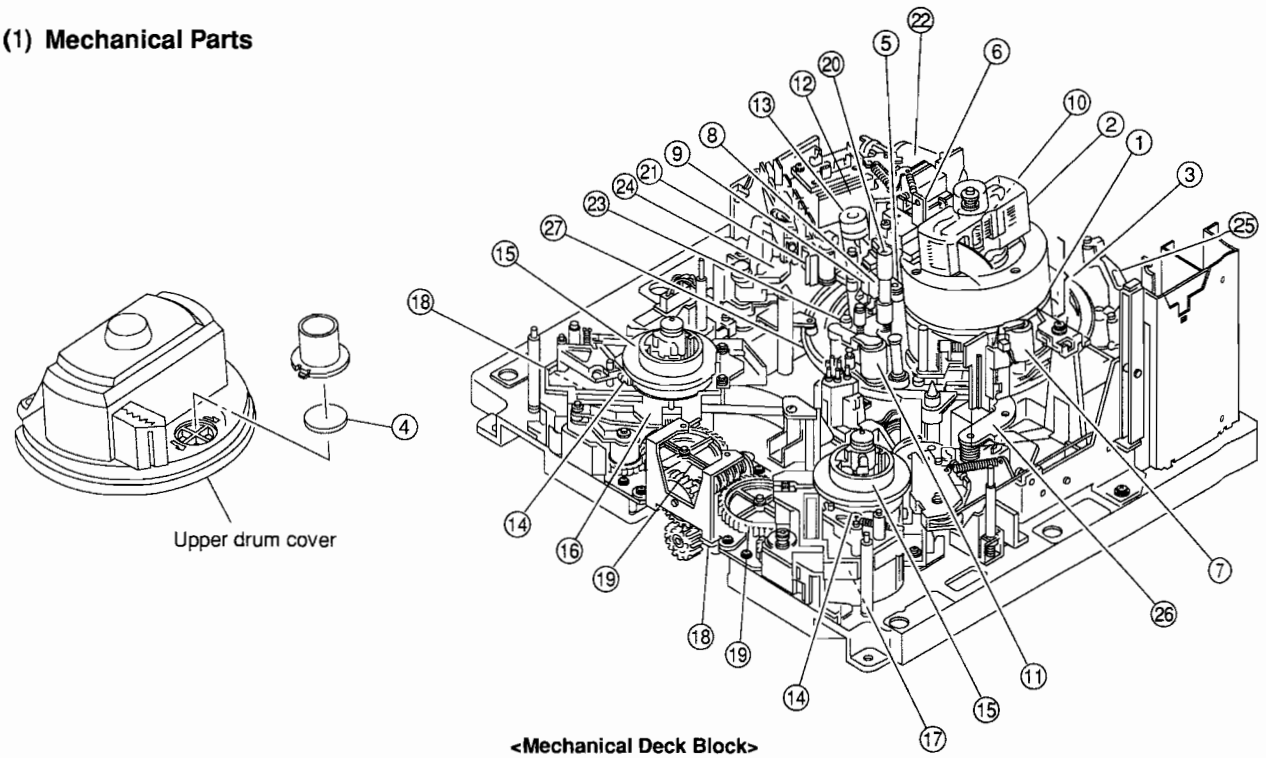
This section describes the replacement procedures of the main mechanical parts, power supply unit and mounted circuit board.

5-1. General Information for Parts Replacement

5-1-1. Index

The replacement procedure of the following parts are described in this section.

(1) Mechanical Parts

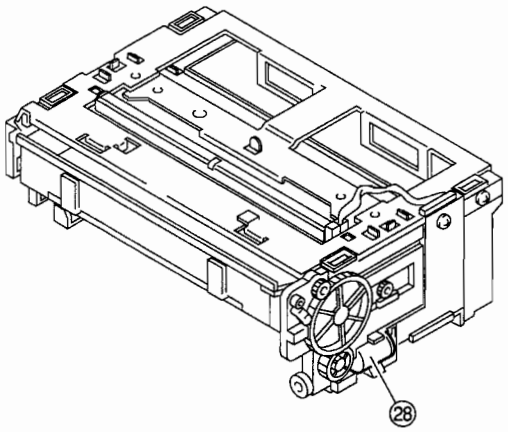


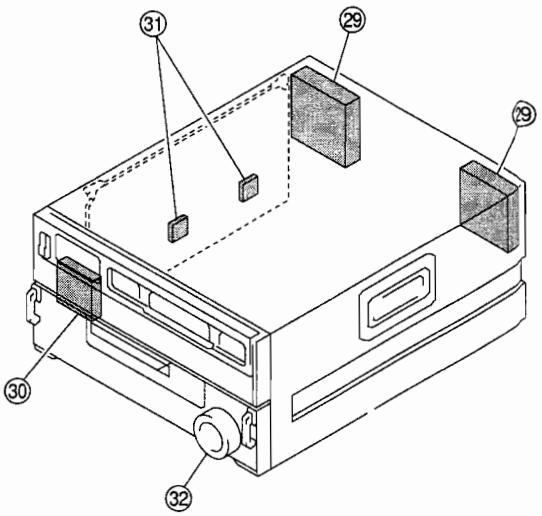
<Mechanical Deck Block>

No.	Part Name	Page
1	Inner drum assembly	5-9
2	Brush/slip ring assembly	5-24
3	Drum assembly	5-28
4	Filter	5-36
5	V Cleaning roller assembly	5-38
6	Video head cleaner	5-38
7	AT head cleaner	5-43
8	CTL head	5-46
9	Full erase head	5-50
10	AT head	5-54
11	Pinch roller	5-59
12	Pinch solenoid	5-62
13	Capstan motor	5-72
14	Brake lining	5-90

No.	Part Name	Page
15	Reel table assembly	5-78
16	Reel motor assembly	5-94
17	Brake solenoid	5-107
18	Reel shift motor	5-122
19	Reel shift gear	5-117
20	Tape guide	5-127
21	Tape cleaner	5-128
22	Threading motor	5-130
23	Ring roller	5-136
24	S tension regulator assembly	5-153
25	T tension arm	5-155
26	T drawer arm	5-159
27	Threading ring assembly	5-136

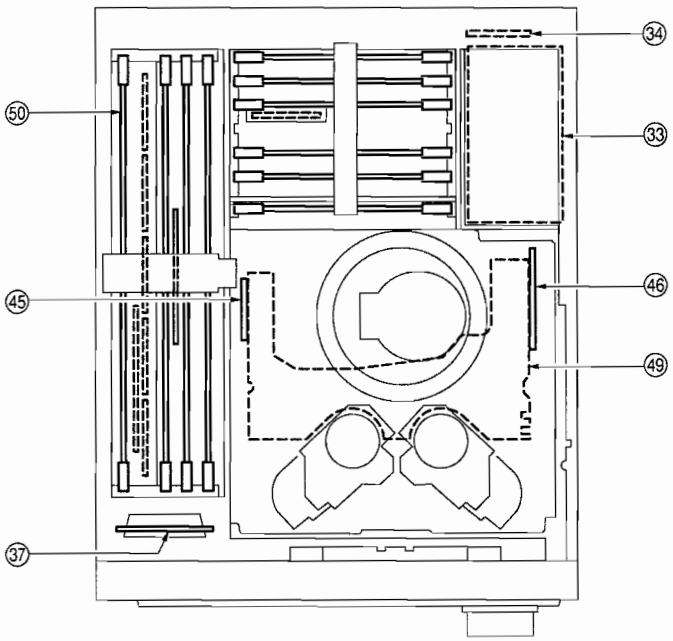
<Cassette compartment>



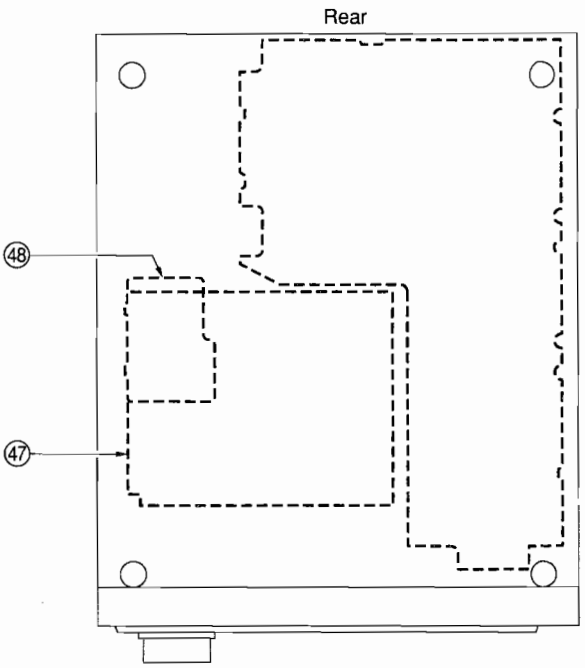


No.	Part Name	Page
28	Cassette compartment motor	5-169
29	Fan motor (rear)	5-176
30	Fan motor (front)	5-178
31	Fan motor (DIF-91A board)	5-180
32	Search dial	5-184

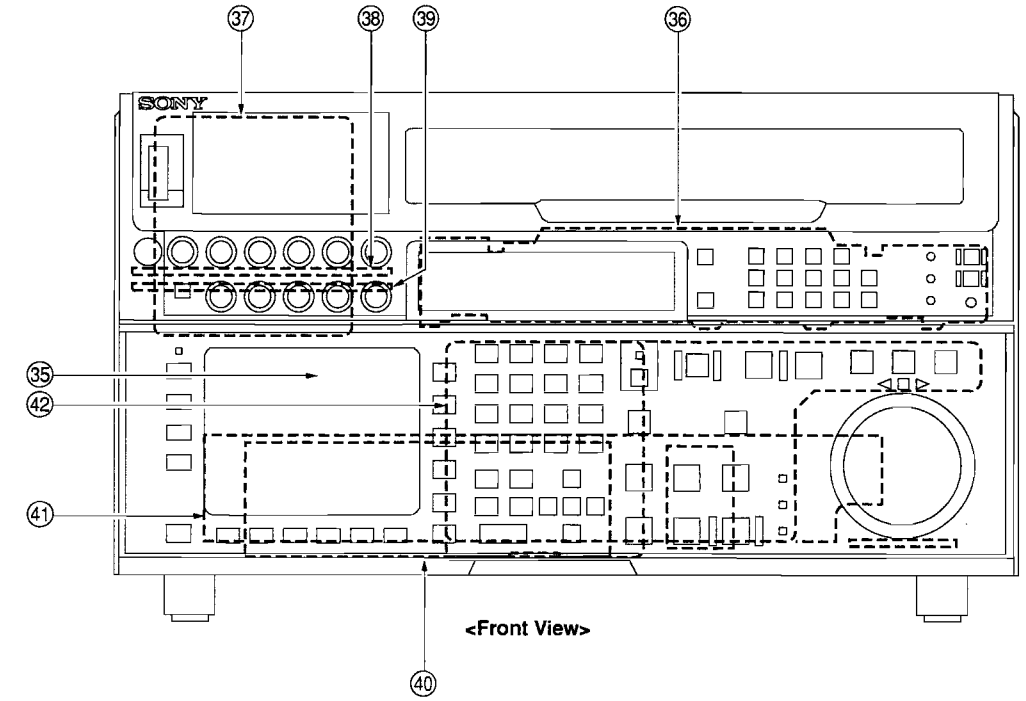
(2) Power Supply Unit and Boards



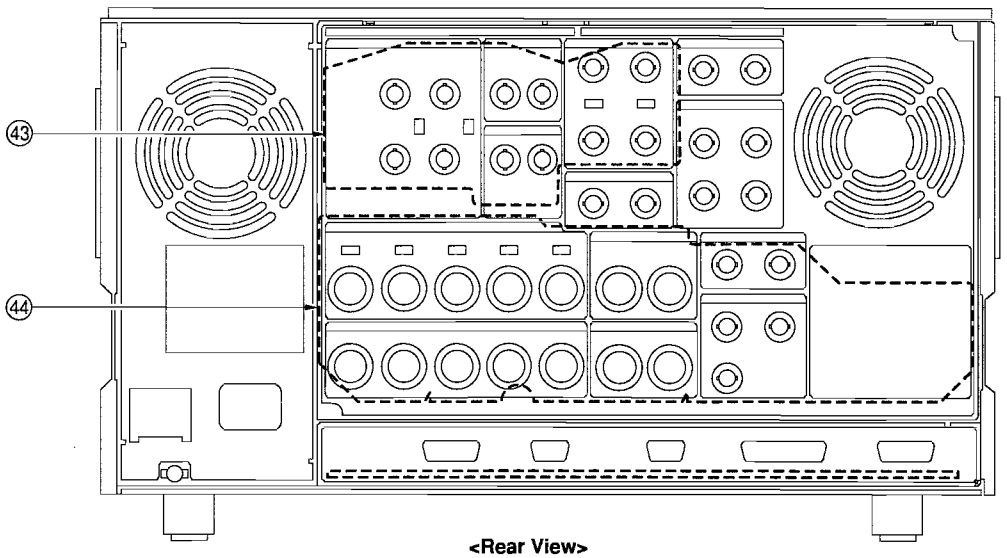
<Top View>



<Bottom View>



<Front View>



<Rear View>

No.	Part Name	Page
33	Power supply unit	5-181
34	Power supply board (AC-204)	5-181
35	EL panel	5-183
36	SWC-17E board	5-186
37	FP-103 board	5-187
38	VR-152 board	5-188
39	VR-153 board	5-189
40	SWC-37 board	5-190
41	CP-266B board	5-191

No.	Part Name	Page
42	KY-330A board	5-191
43	CP-348 board	5-192
44	CP-349 board	5-193
45	HN-265 board	5-199
46	HN-266 board	5-200
47	DR-307 board	5-194
48	DT-34C board	5-195
49	HN-264 board	5-196
50	DIF-91A board	5-202

5-1-2. Basic Knowledge

WARNING

Be sure to turn off the power and disconnect the power cable from the unit before launching the service work,

1. Tape Cleaner

CAUTION

Never touch the edge of the tape cleaner with bare hands.
It is in danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when replacing or adjusting the peripheral parts.

2. Tools

Clean the surface of the tool with a cleaning cloth moistened with cleaning fluid before use it.

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Be careful not to damage the tool. If the flawed tool is used, adjustment cannot be performed correctly.

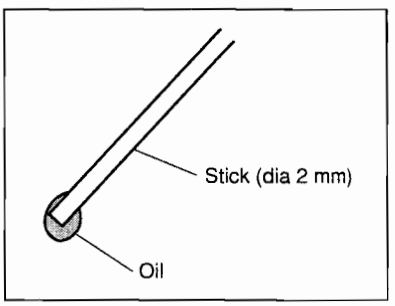
3. Note

(1) Grease and Oil

Please use only the specified grease and oil.
If the different grease or oil is used, major malfunctions may be caused due to differences in viscosity and ingredients.
And if the grease or oil that has been mixed with dust is used, major malfunctions may be caused.
Use the following grease and oil.

- Grease (SGL-505) : 7-661-000-10
- Oil : 7-661-018-18

Smear just enough grease to create a thin film on the surface of the part.
Any grease that adheres to other surrounding parts must be wipe with gauze or soft cloth.
A drop of oil is defined as follows :
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.
Do not use the grease and oil except for specified portions.



Oil

(2) Stop Washer and E Ring

It should not be used the stop washer and E ring once again.
It is recommended checking a required stop washer and E ring before replacement, and preparing more than required number.

5-1-3. Threading End Mode and Unthreading End Mode

1. Threading End Mode

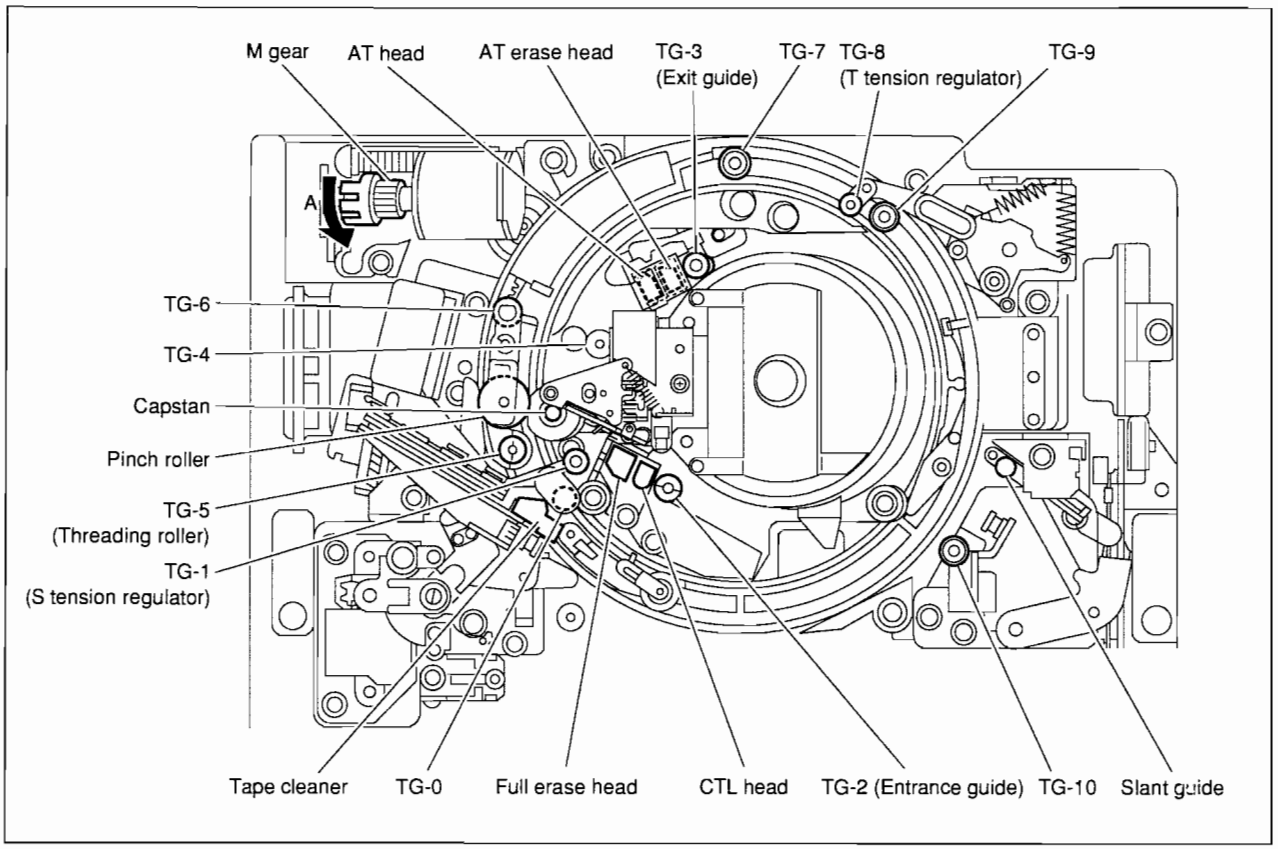
Threading end mode means that the threading ring rotates in the counterclockwise direction, then stops.

There are three ways of putting the unit into the threading end mode without installing the cassette compartment.

Method ① : Turn the power on.

Method ② : Press the STOP button under power-on state.

Method ③ : Turn the M gear of the gear box assembly in the direction of the arrow A.



Threading End Mode

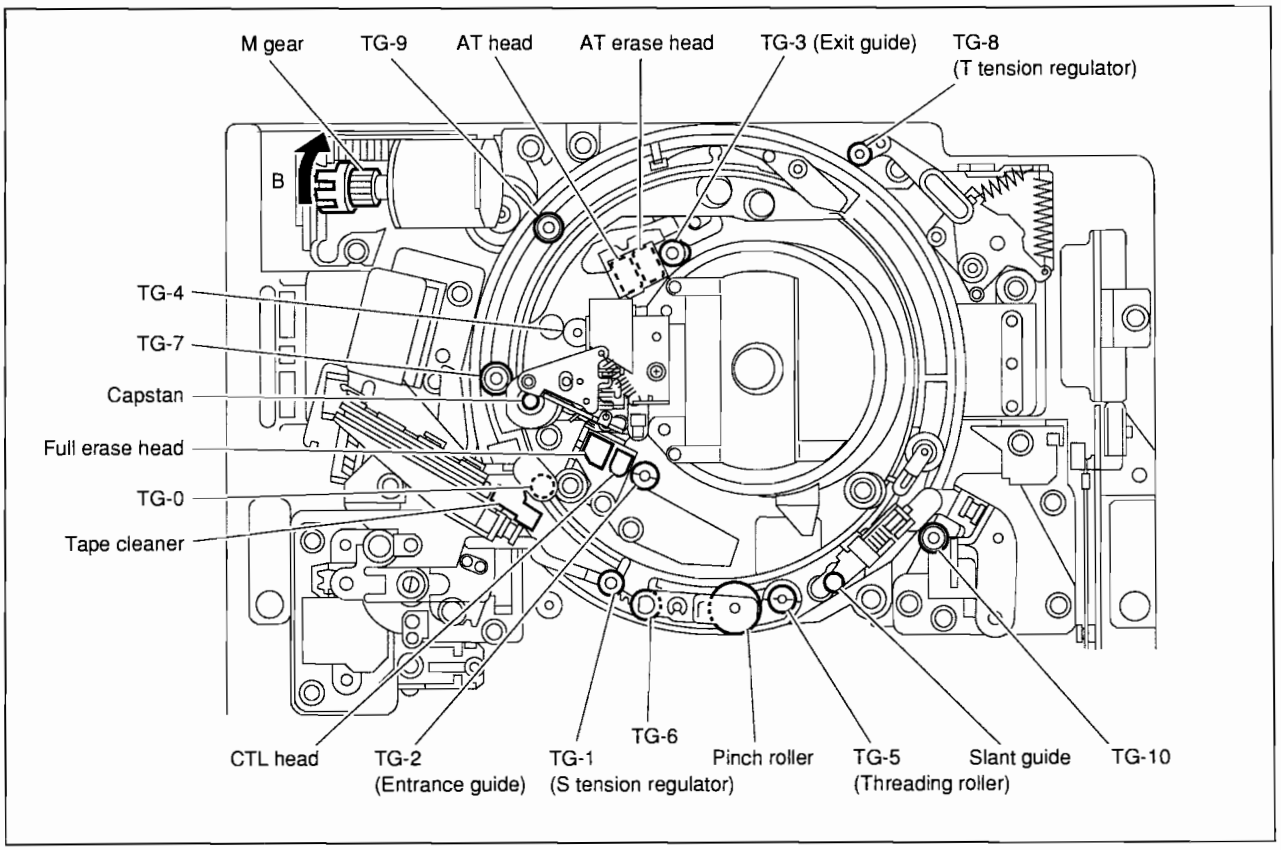
2. Unthreading End Mode

Unthreading end mode means that the threading ring rotates in the clockwise direction, then stops. (It is same state with EJECT completion mode.)

There are two ways of putting the unit into the unthreading end mode without installing the cassette compartment.

Method ① : Press the EJECT button under threading end mode.

Method ② : Turn the M gear of the gear box assembly in the direction of the arrow B.



Unthreading End Mode

5-1-4. L Cassette Position and S Cassette Position

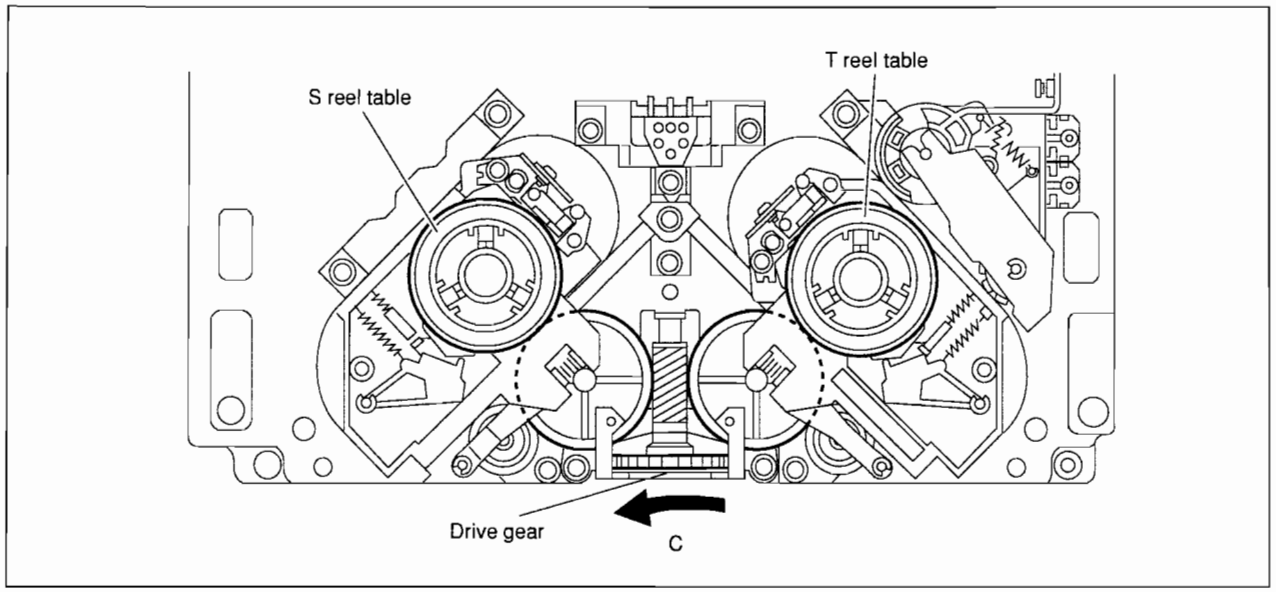
1. L Cassette Position

L cassette position means that the reel tables are in the position of L cassette tape.

There are two ways of putting the reel tables into the L cassette position without installing the cassette compartment.

Method ① : Press the switch S1000 (C-1/side A) on the SS-88 board under power-on state.

Method ② : Turn the drive gear in the direction of the arrow C.



L Cassette Position

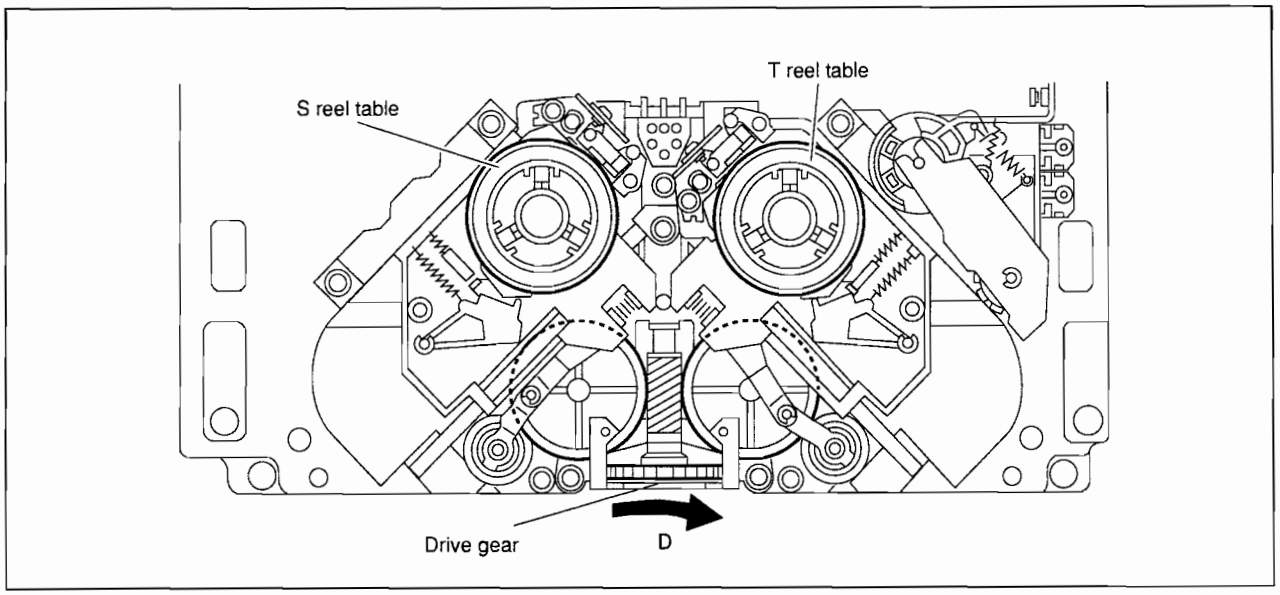
2. S Cassette Position

S cassette position means that the reel tables are in the position of S cassette tape.

There are two ways of putting the reel tables into the S cassette position without installing the cassette compartment.

Method ① : Press the switch S1000 (C-1/side A) on the SS-88 board under power-on state.

Method ② : Turn the drive gear in the direction of the arrow D.



S Cassette Position

5-2. Inner Drum Assembly Replacement

Replace the inner drum assembly every 1,000 hours of drum rotation.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Remove the Upper Drum Cover Assembly
3. Disconnect the Flexible Board (CN241/HN-266 Board)
4. Remove the Brush/Slip Ring Assembly
5. Remove the Upper Drum Assembly
6. Remove the Inner Drum Assembly
7. Cleaning (Inner Drum Assembly Mounting Surface, Drum Support Mounting Surface, Lower Drum Flange Surface, Tape Running Surface, Lead Surface, and Contacting Points)
8. Install the Inner Drum Assembly
9. Install the Upper Drum Eccentricity Adjustment Tool
10. Adjust the Inner Drum Eccentricity
11. Remove the Upper Drum Eccentricity Adjustment Tool
12. Cleaning (Height Determining Plate's Lower Surface, Drum Support's Upper Surface, and Upper Drum Contacting Surface)
13. Install the Upper Drum Assembly
14. Cleaning (DR-205 Board's Contacting Points and Brush/Slip Ring Assembly Mounting Surface)
15. Install the Brush/Slip Ring Assembly
16. Connect the Flexible Board (CN241/HN-266 Board)
17. Cleaning (Rotary Heads and Upper Drum's Tape Running Surface)
18. Install the Upper Drum Cover Assembly
19. Install the Video Head Cleaner Assembly

Adjustment after Replacement

20. Confirm the Tape Running (Refer to section 6-1-2.)
21. Confirm the Video Tracking (Refer to section 6-1-3.)
22. Confirm the CTL Head Height (Refer to section 6-1-4.)
23. Adjust the CTL Head Position (Refer to section 6-1-5.)
24. Confirm the AT Head Height (Refer to section 6-1-6.)
25. Adjust the AT Head Position (Refer to section 6-1-9.)
26. Adjust the RF Switching Position
    (Refer to section 4-4-1. 2 in maintenance manual part 1.)
    ([F 6] : RF SW AUTO)
27. Confirm the SAT Operation (Refer to section 4-3-3 in maintenance manual part 1.)
    ([F 7] : FUNC MODE)
28. Adjust the Drive Gain (Refer to section 4-4-2 in maintenance manual part 1.)
    ([F 4] : DRIVE GAIN)
29. Adjust the Head Offset Level (Refer to section 4-4-2 in maintenance manual part 1.)
    ([F 5] : HEAD OFFSET)
30. Adjust the RF (Refer to section 4-4-3. 1 in maintenance manual part 1.)
    ([F 4] : DRUM REPLACE)

Note

When the rotary head tip was worn or damaged, replace the inner drum assembly. It cannot be replaced only head tip.

Basic Knowledge

For except the periodic replacement time, replace the inner drum assembly in the following case.

- A correct RF signal waveform cannot be obtained even if the tracking adjustment is performed.

Preparation

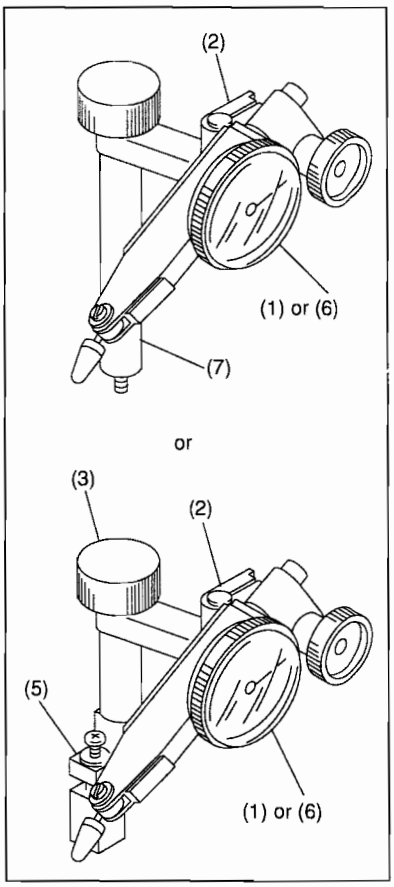
1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Hexagonal wrench driver (D = 2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver's bit (+2 mm, L = 75 mm) : J-6323-420-A
- Torque screwdriver's hexagonal bit (D = 2.5 mm, L = 120 mm) : J-6251-090-A

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

- Upper drum eccentricity adjustment tool (1) : J-6001-840-A
  or upper drum eccentricity adjustment tool (6) : J-6325-530-A
- Upper drum eccentricity adjustment tool (2) : J-6001-830-A
- Upper drum eccentricity adjustment tool (3) : J-6001-820-A
- Upper drum eccentricity adjustment tool (5) : J-6087-000-A



Upper Drum Eccentricity Adj. Tools

Notes

(1) The eccentricity adjustment tool is named an "upper drum eccentricity adjustment tool" in this case. In this unit, the eccentricity value of the inner drum is measured.

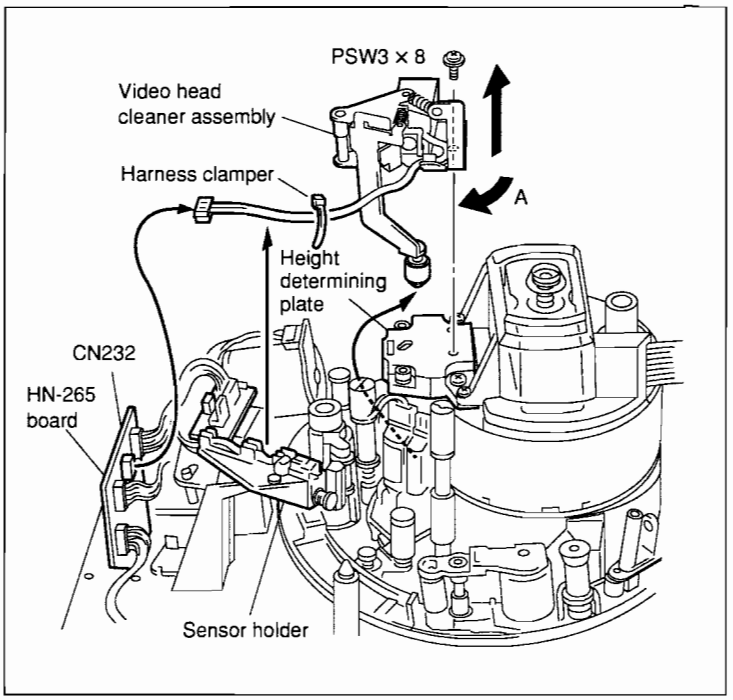
(2) The upper drum eccentricity adjustment tool is assembled for use as shown in the figure.

(3) The following tools can be used instead of the upper drum eccentricity adjustment tool (7).
- Upper drum eccentricity adjustment tool (3) : J-6001-820-A
- Upper drum eccentricity adjustment tool (5) : J-6087-000-A

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN232 on the HN-265 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the arrow A direction, and remove it from the height determining plate.



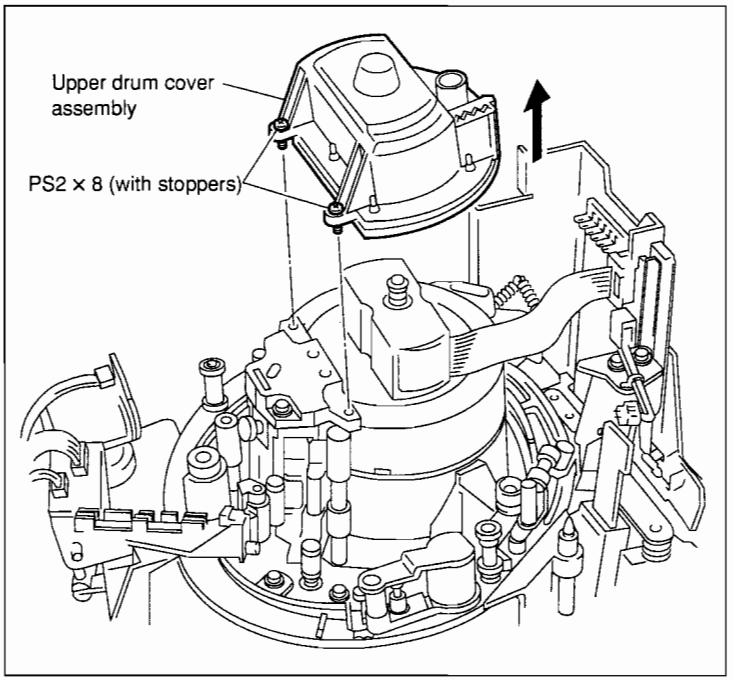
Video Head Cleaner Assembly Removal

2. Remove the Upper Drum Cover Assembly

Loosen the two screws and remove the upper drum cover assembly.

Note

These screws cannot be removed because of stoppers.



Upper Drum Cover Assembly Removal

3. Disconnect the Flexible Board

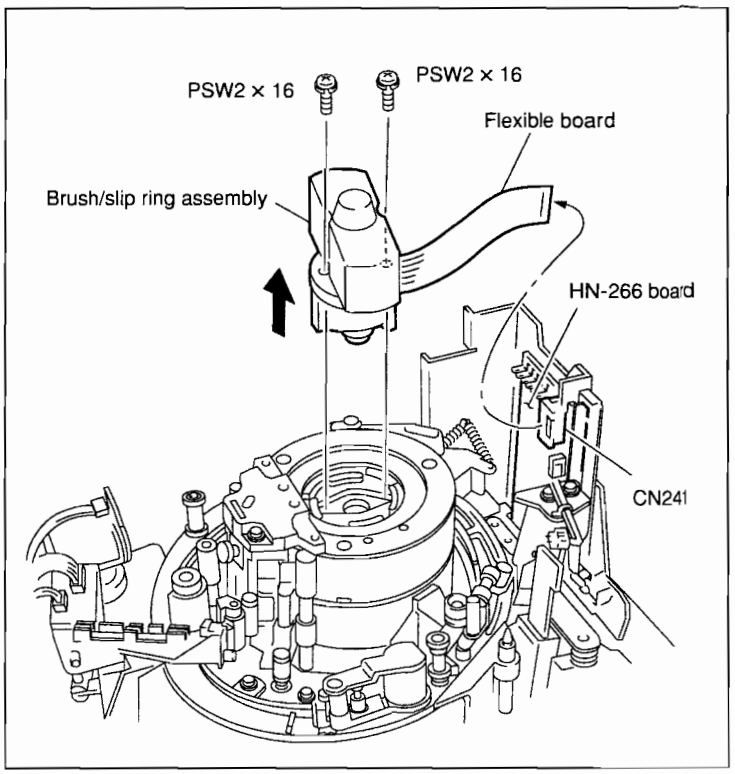
Disconnect the flexible board from connector CN241 on the HN-266 board.

4. Remove the Brush/Slip Ring Assembly

Remove the two screws, then remove the brush/slip ring assembly.

Notes

- Do not apply excessive force to the brush/slip ring assembly at that time.
- If the screws remain put into the screw holes of the brush/slip ring assembly, remove them once.
  When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



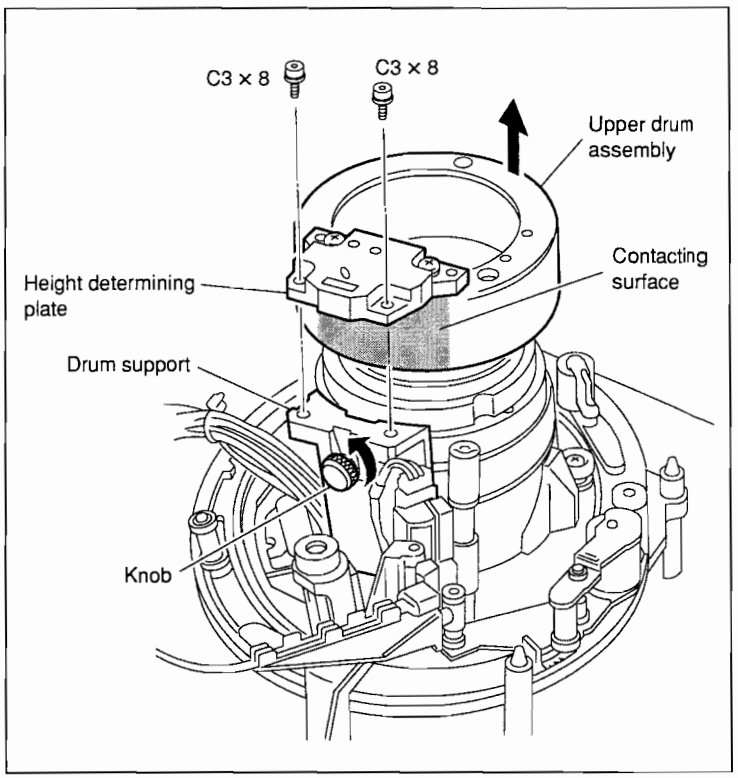
Brush/Slip Ring Assembly Removal

5. Remove the Upper Drum Assembly

(1) Rotate the knob manually by about two turns, then loosen.
(2) Remove the two screws using a hexagonal wrench driver.
(3) Raise the upper drum assembly just above, then remove.

Notes

- Be careful not to damage the tape running surface and the contacting surface (shaded portion in the figure) of the upper drum when removing the upper drum assembly. Also, take care not to damage the lower edge portion of the upper drum.
- Be sure to put the removed upper drum assembly with the upper surface (on which the height determining plate is installed) down. If not, the edge portion may be damaged.
- Be careful not to damage the drum support mounting surface and lower drum's upper edge portion after the upper drum assembly was removed.



Upper Drum Assembly Removal

6. Remove the Inner Drum Assembly

(1) Insert the hexagonal wrench driver into the screw hole and loosen the screw fully.

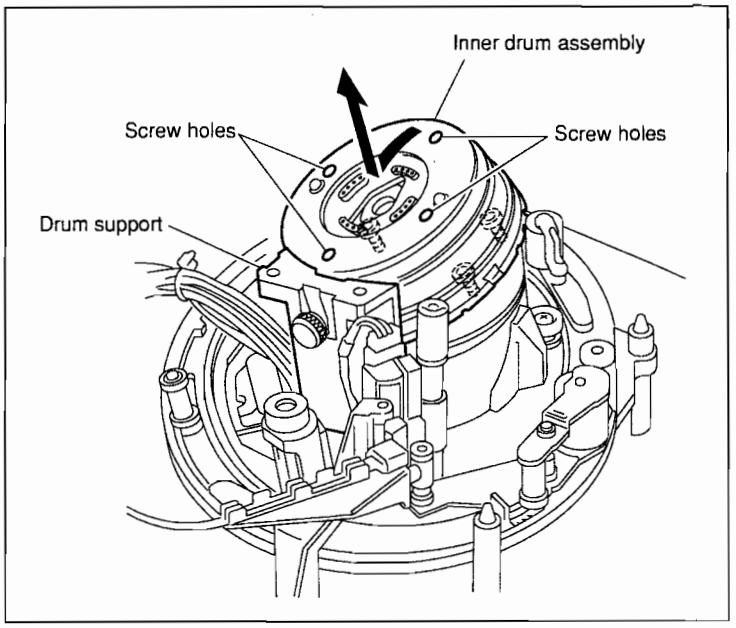
Note

The inner drum assembly is fixed with the four fixing screws (C3 × 12) in the screw holes. These screws cannot be removed because of stoppers.

(2) Remove the inner drum assembly while inclining it as shown in the figure.

Note

Be careful not to damage the upper drum contacting surface of the drum support.



Inner Drum Assembly Removal

Installation

Note

The inner drum assembly for repair has an inner drum cover.
This cover is provided to protect the rotary heads. Do not remove the inner drum cover until the inner drum assembly has been installed.

7. Cleaning

(1) Clean the portion below with a cleaning cloth moistened with cleaning fluid.
- New inner drum assembly mounting surface (shaded portion shown in the figure)
- Drum support's upper drum mounting surface (shaded portion shown in the figure)
- Lower drum flanges (shaded portion shown in the figure) and edge portion
- Lower drum's tape running surface and lead portion

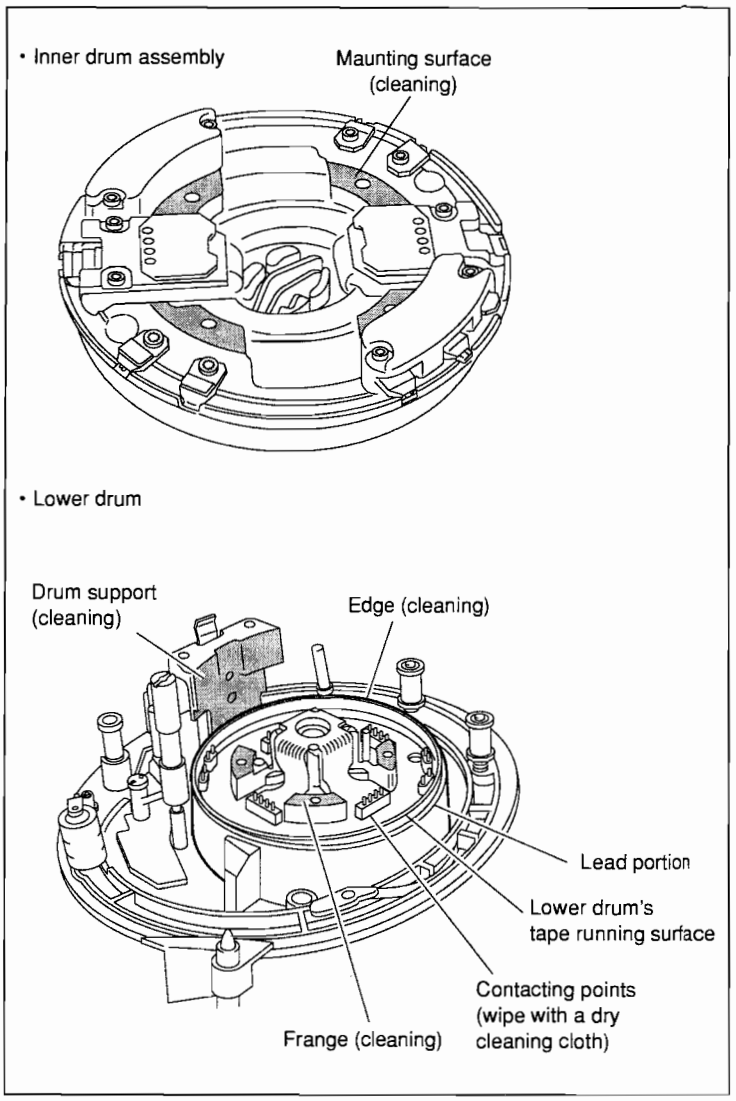
Note

After cleaning, wipe with a dry cleaning cloth.

(2) Wipe the portion below with a dry cleaning cloth.
- Lower drum's contacting points

Note

Do not apply cleaning fluid to the contacting points.



Cleaning

8. Install the Inner Drum Assembly

(1) Align the holes on the DR-320 board and the drum support.

Note

At this time, be careful not to touch the contacting points and flanges.

(2) Align the hole on the inner drum assembly with the positioning shaft, then put the inner drum assembly on the flange of the lower drum.

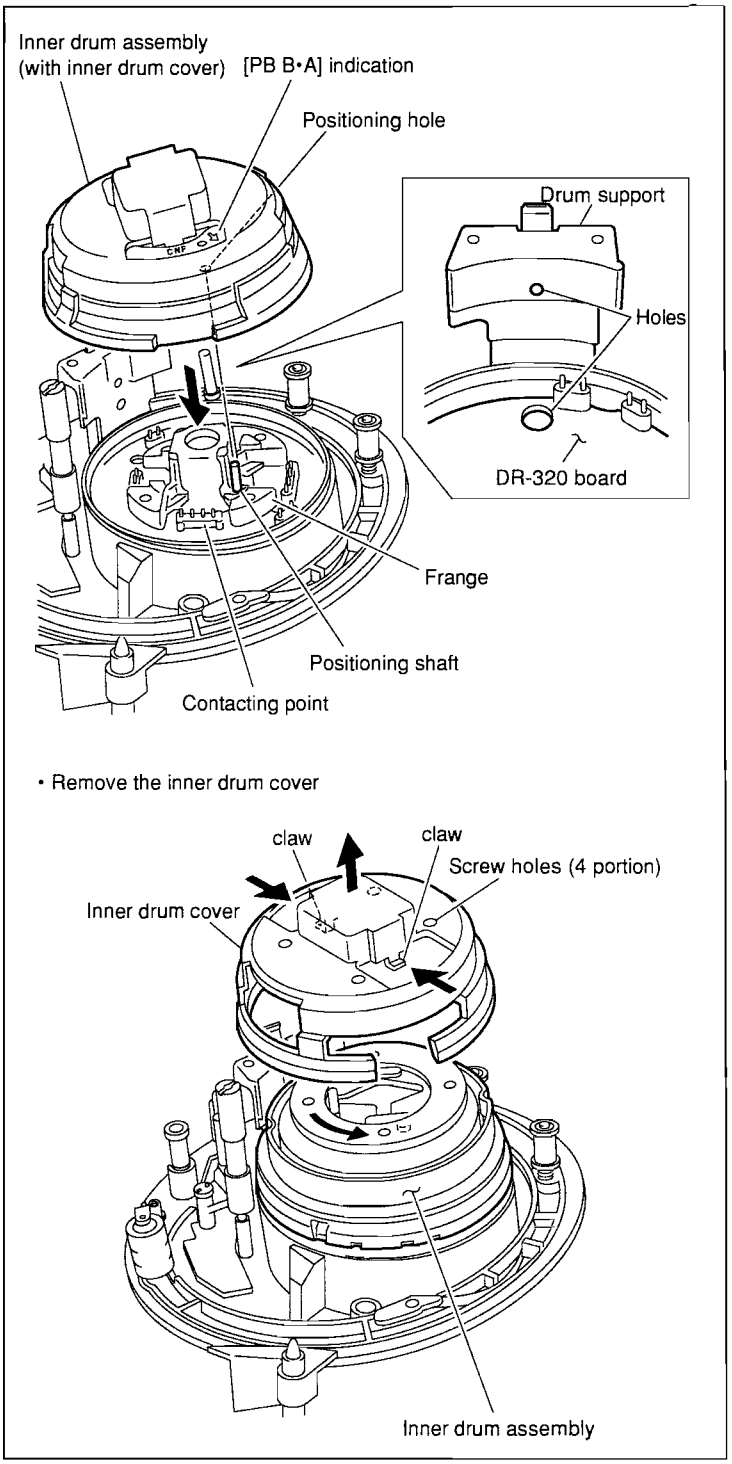
Notes

- When positioning, put a "PB B.A" indication on the board cover toward the shaft.
- At this time, be careful not to hold the claws of the inner drum cover.
- Be careful not to hit the inner drum assembly against the AT head, peripheral tape guides and drum support.

(3) Tighten the four screws (C3 × 12) temporarily and equally while pushing the inner drum downward.

(4) Turn the inner drum counterclockwise and check that there is no abnormal mechanical sound.

(5) Press the claws of the inner drum cover in the arrow direction and remove the inner drum cover.



Inner Drum Assembly Installation

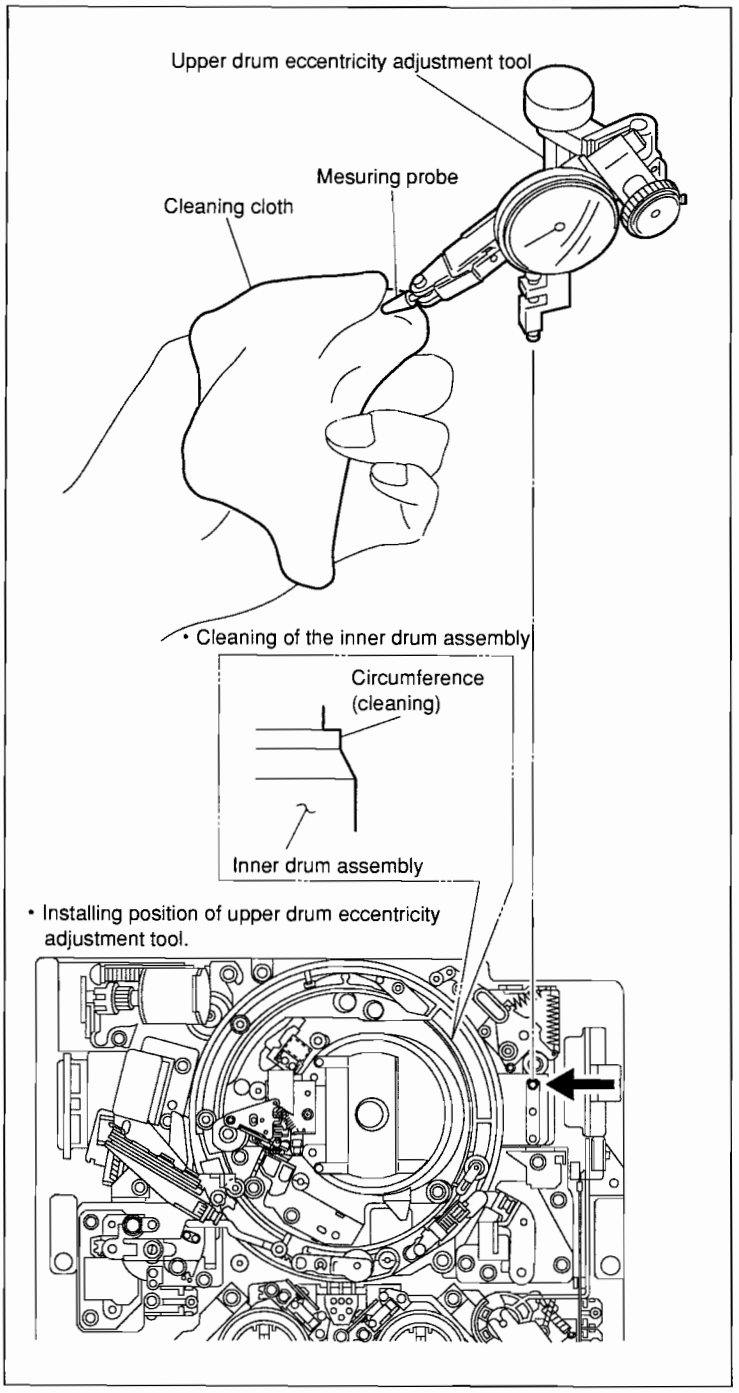
9. Install the Upper Drum Eccentricity Adjustment Tool

(1) Clean the measuring probe and the inner drum portion shown in the figure (the circumference) with a cleaning cloth moistened with cleaning fluid.

Note

Do not make dirt adhere to the measuring probe during use. This may damage the inner drum.

(2) Install the eccentricity adjustment tool in the chassis shown in the figure.



Upper Drum Eccentricity Adjustment Tool Installation

10. Adjust the Inner Drum Eccentricity

(1) Set the measuring probe of the tool to the inner drum portion shown in the figure.

Note

Take care that the measuring probe does not touch the rotary heads.

(2) Rotate the inner drum slowly counterclockwise. Confirm that the gauge's pointer deviation meets the following specification during one turn of the inner drum.

Specification : 3 µm or less

If it is out of specification, repeat the following steps ① to ③.

① Rotate the inner drum slowly counterclockwise and stop the rotation where the pointer deviation is minimum.

② Push the board cover in the position opposite to the measuring probe by 180 degrees toward the arrow direction so that the pointer deviation is 1/2 of the maximum value.

③ Confirm that the pointer deviation meets the specification.

Note

When the pointer does not move even if the board cover is pushed by finger, tighten the four screws fixing the inner drum a little loosely. When the pointer moves immediately, tighten the screws a little firmly.

(3) Tighten the four screws gradually in the order indicated in the board cover.

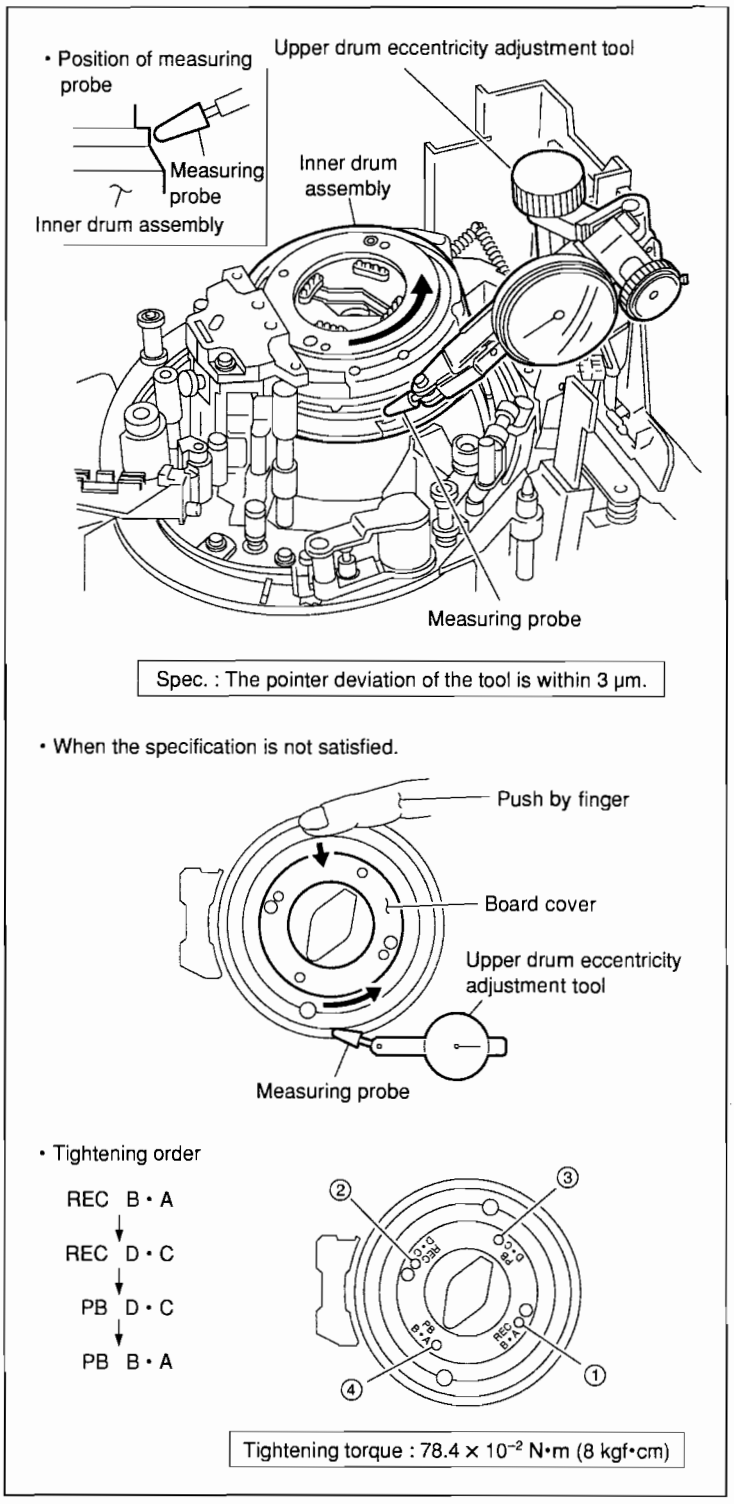
Tightening torque : 39.2×10^{-2} N•m (4 kgf•cm)

(4) Confirm that the pointer deviation meets the specification.

(5) Tighten the four screws gradually in the order indicated in the board cover.

Tightening torque : 78.4×10^{-2} N•m (8 kgf•cm)

(6) Confirm again that the pointer deviation meets the specification.

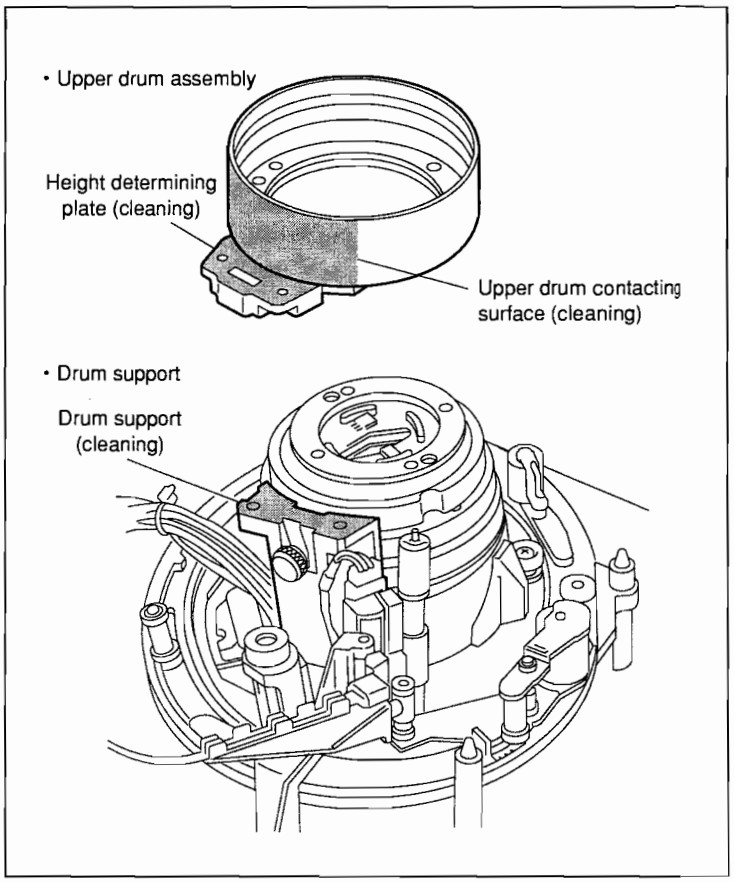

• Position of measuring probe
Measuring probe
Inner drum assembly
Upper drum eccentricity adjustment tool
Inner drum assembly
Measuring probe
Spec. : The pointer deviation of the tool is within 3 µm.
• When the specification is not satisfied.
Push by finger
Board cover
Upper drum eccentricity adjustment tool
Measuring probe
• Tightening order
REC B • A
REC D • C
PB D • C
PB B • A
Tightening torque : 78.4 × 10⁻² N•m (8 kgf•cm)

Inner Drum Eccentricity Adjustment

11. Remove the Upper Drum Eccentricity Adjustment Tool

12. Cleaning

Clean the lower surface (shaded portion in the figure) of the height determining plate, the upper surface of the drum support (shaded portion in the figure), and the upper drum contacting surface with a cleaning cloth moistened with cleaning fluid.



Cleaning

13. Install the Upper Drum Assembly

(1) Install the upper drum assembly slowly so that the leaf spring is put into the hole of the height determining plate.

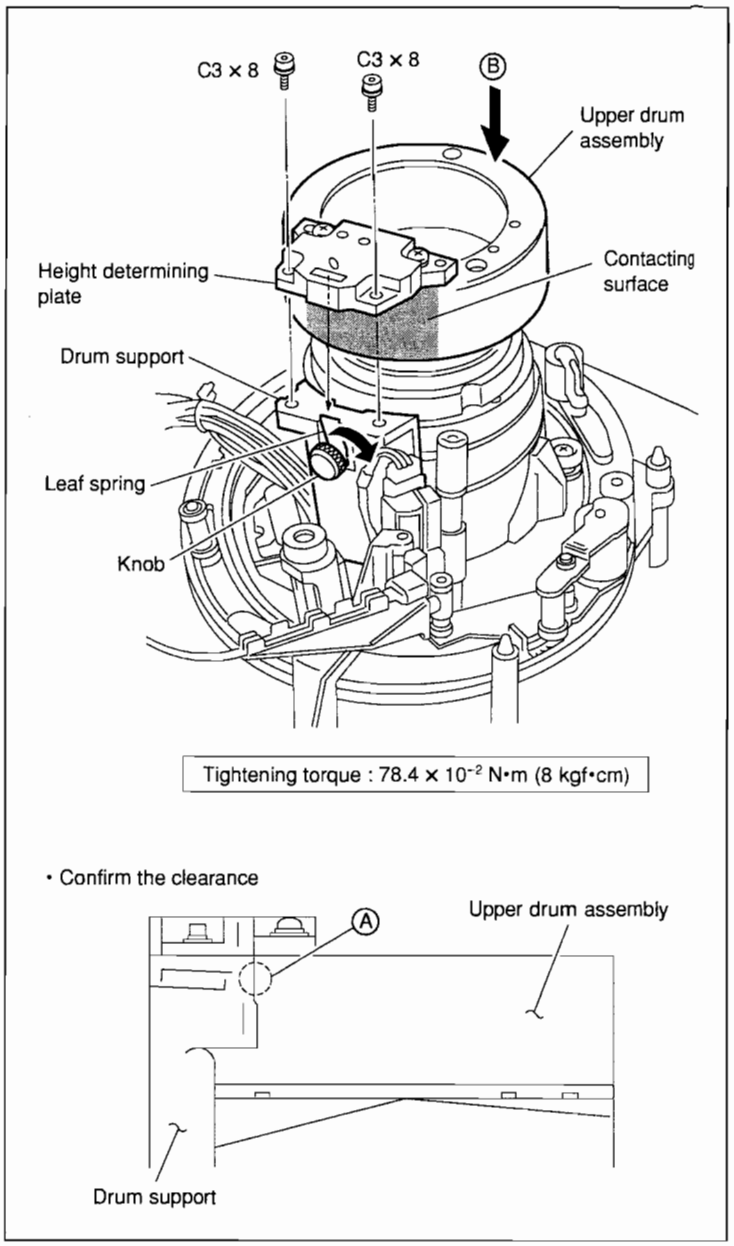
Note

Take care that the tape running surface and the contacting surface (shaded portion in the figure) of the upper drum does not strike against the drum support.
Also, be careful not to damage the lower edge portion of the upper drum.

(2) Tighten the two screws each by three turns.
(3) Tighten the knob. At that time, confirm that the portion B of the upper drum assembly somewhat rises to the surface.
(4) Tighten the two screws alternately and gradually.

Tightening torque : 78.4×10^{-2} N•m (8 kgf•cm)

(5) Confirm that there is no clearance between the drum support and the upper drum assembly (portion A in the figure, both of left and right sides) as visual.



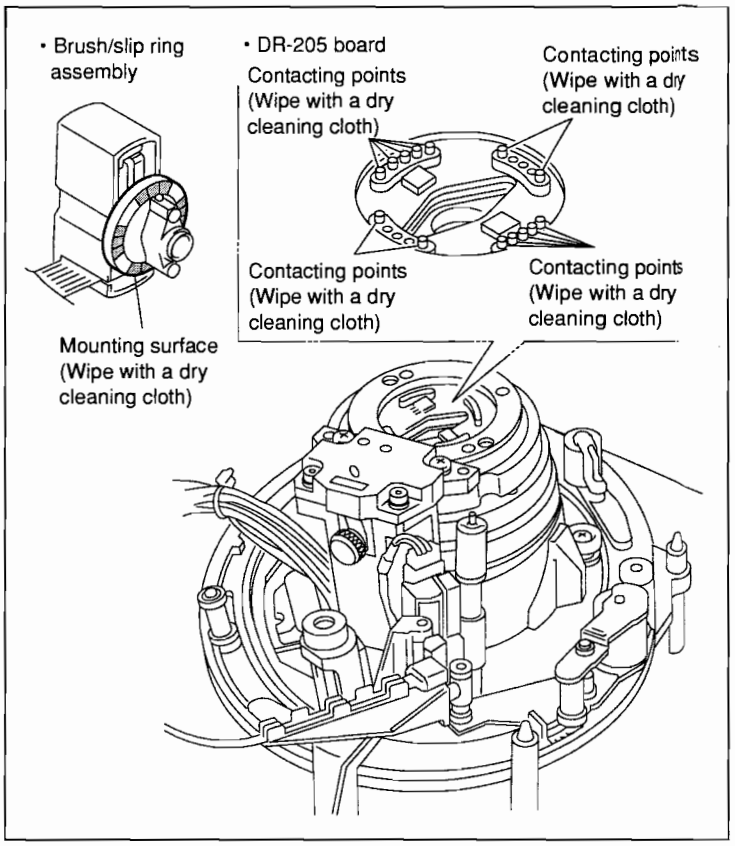
Upper Drum Assembly Installation

14. Cleaning

Wipe the brush/slip ring assembly mounting surface (shaded portion in the figure) and the DR-205 board contacting points with a dry cleaning cloth.

Notes

- Do not apply cleaning fluid to the contacting points.
- If the screws remain put into the screw holes of the brush/slip ring assembly, remove them once. When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.


• Brush/slip ring assembly
• DR-205 board
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Mounting surface (Wipe with a dry cleaning cloth)

Cleaning

15. Install the Brush/Slip Ring Assembly

(1) Install the brush/slip ring assembly in the direction shown in the figure.

(2) Tighten the two screws alternately and gradually while pushing both sides of the flange equally from above.

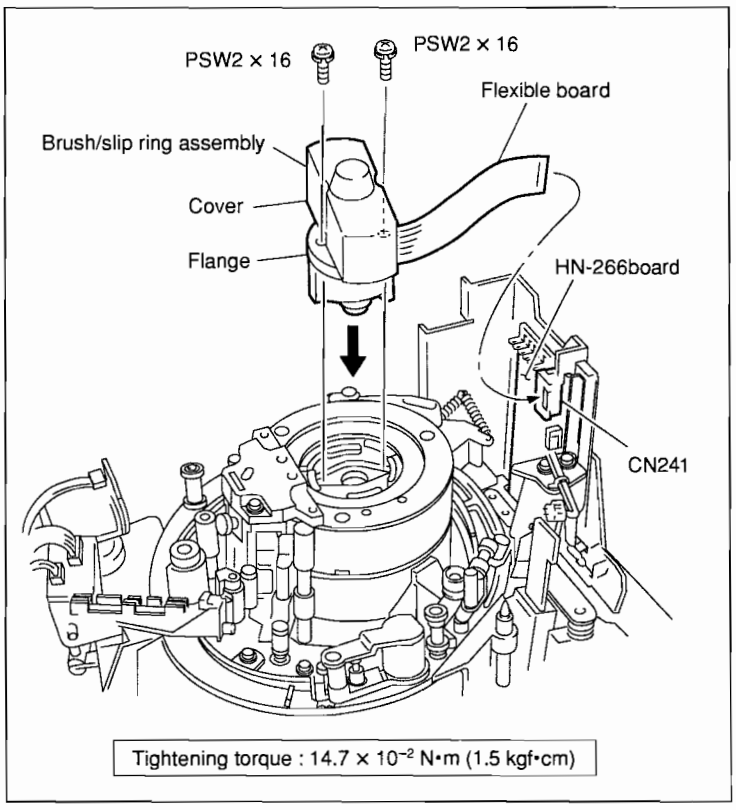
Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

Note

Never apply excessive force to the cover.

16. Connect the Flexible Board

Connect the flexible board into connector CN241 on the HN-266 board.



Brush/Slip Ring Assembly Installation

17. Cleaning

Clean the portion below.

(1) Rotary heads (Refer to section 5-2-3 in maintenance manual part 1.)

(2) Upper drum's tape running surface (Refer to section 5-2-4 in maintenance manual part 1.)

Note

After cleaning, wipe with a dry cleaning cloth.

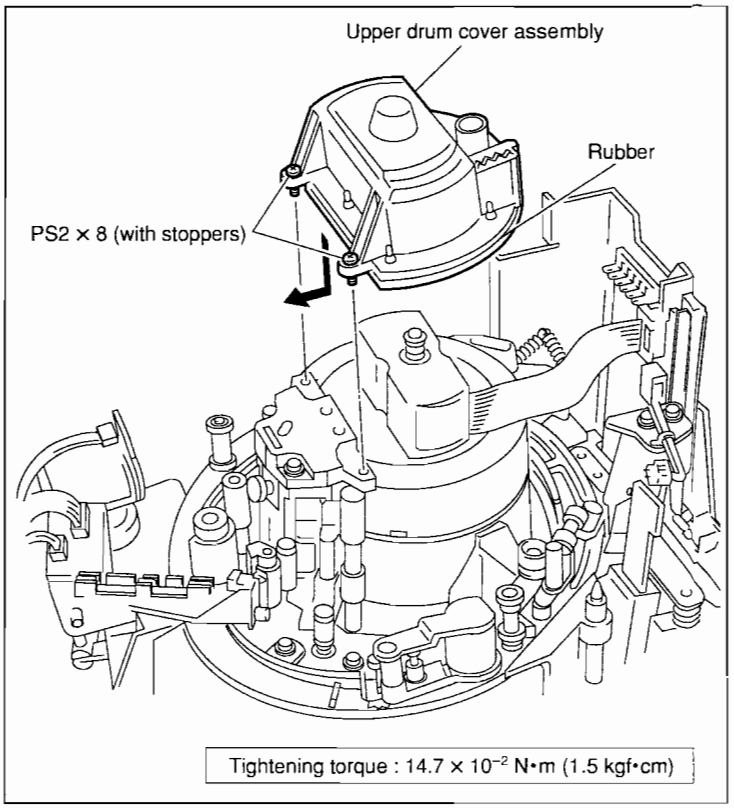
18. Install the Upper Drum Cover Assembly

(1) Tighten the two screws while pushing the upper drum cover assembly toward the height determining plate.

Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

(2) Confirm that the rubber of the upper drum cover assembly does not turn over.

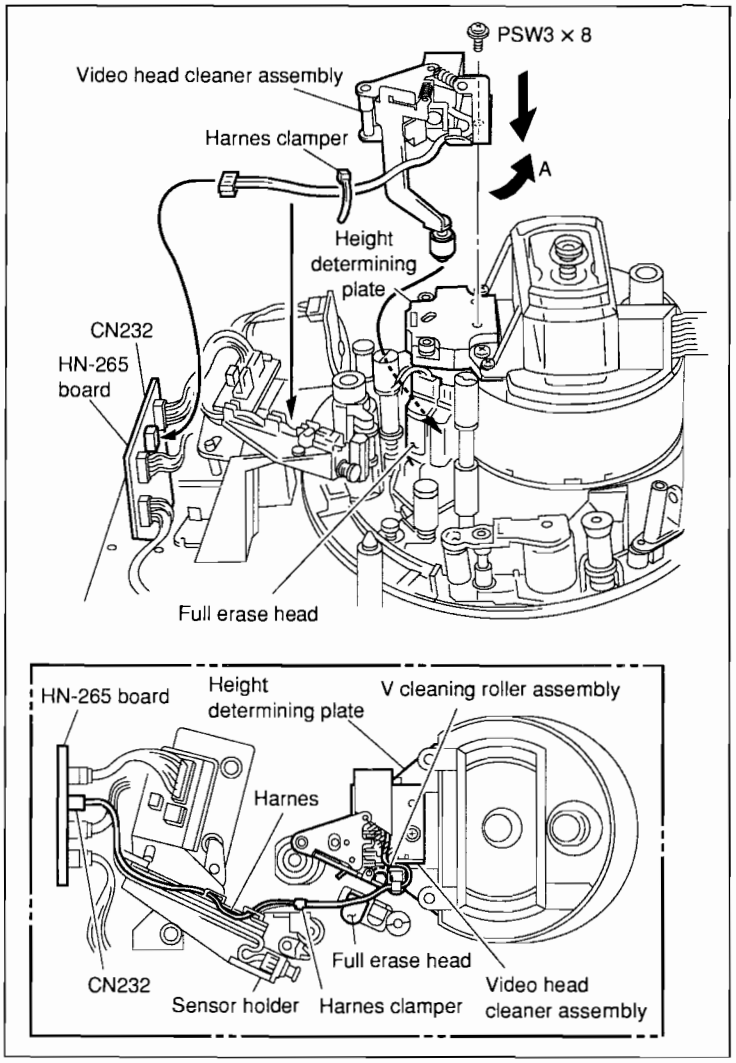
(3) Confirm that the no clearance between the upper drum cover assembly and the upper drum.



Upper Drum Cover Assembly Installation

19. Install the Video Head Cleaner Assembly

(1) Insert the V cleaning roller assembly between the height determining plate and full erase head as shown in the figure.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determining plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the arrow A direction.
(4) Fix the harness to the sensor holder position shown in the figure.
(5) Connect a connector to CN232 on the HN-265 board.
(6) Bind the CTL/full erase head harness and the video head cleaner assembly harness with the harness clamper or the equivalent clamper.



Video Head Cleaner Assembly Installation

Adjustment after Replacement

20. Confirm the Tape Running
Refer to section 6-1-2.

21. Confirm the Video Tracking
Refer to section 6-1-3.

22. Confirm the CTL Head Height
Refer to section 6-1-4.

23. Adjust the CTL Head Position
Refer to section 6-1-5.

24. Confirm the AT Head Height
Refer to section 6-1-6.

25. Adjust the AT Head Position
Refer to section 6-1-9.

26. Adjust the RF Switching Position
Refer to section 4-4-1. 2 in maintenance manual part 1.
(F 6 : RF SW AUTO)

27. Confirm the SAT Operation
Refer to section 4-3-3 in maintenance manual part 1.
(F 7 : FUNC MODE)

28. Adjust the Drive Gain
Refer to section 4-4-2 in maintenance manual part 1.
(F 4 : DRIVE GAIN)

29. Adjust the Head Offset Level
Refer to section 4-4-2 in maintenance manual part 1.
(F 5 : HEAD OFFSET)

30. Adjust the RF
Refer to section 4-4-3. 1 in maintenance manual part 1.
(F 4 : DRUM REPLACE)

5-3. Brush/Slip Ring Assembly Replacement

Replace the brush/slip ring assembly every 3,000 hours of drum rotation.

Outline

Replacement

1. Remove the Upper Drum Cover Assembly
2. Disconnect the Flexible Board (CN241/HN-266 Board)
3. Remove the Brush/Slip Ring Assembly
4. Cleaning (DR-205 Board's Contacting Points and Brush/Slip Ring Assembly Mounting Surface)
5. Install the Brush/Slip Ring Assembly
6. Connect the Flexible Board (CN241/HN-266 Board)
7. Install the Upper Drum Cover Assembly

Adjustment after Replacement

8. Perform the Servo/DT Check
   (Refer to section 4-3-3 in maintenance manual part 1.)
   ([F 1] : DT DRIVER/[F 2] : SG LOOP/[F 3] : WOBBLING)
9. Perform the RF Check (Refer to section 4-3-4 in maintenance manual part 1.)
   ([F 7] : RF CHECK)

Note

When the brush or slip ring was worn or damaged, replace the brush/slip ring assembly. It cannot be replaced only brush or slip ring.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm) : J-6323-420-A

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

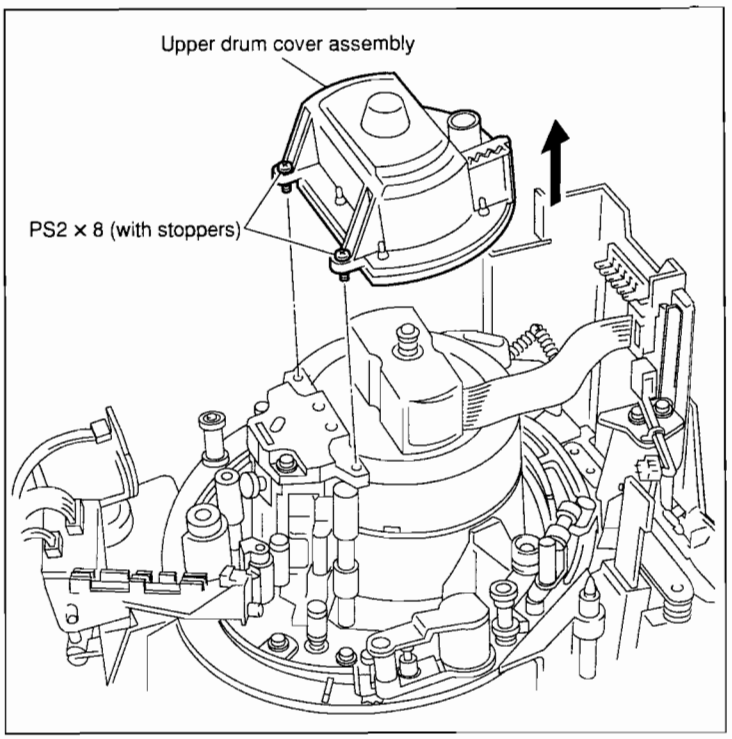
Removal

1. Remove the Upper Drum Cover Assembly

Loosen the two screws and remove the upper drum cover assembly.

Note

These screws cannot be removed because of stoppers.



Upper Drum Cover Assembly Removal

2. Disconnect the Flexible Board

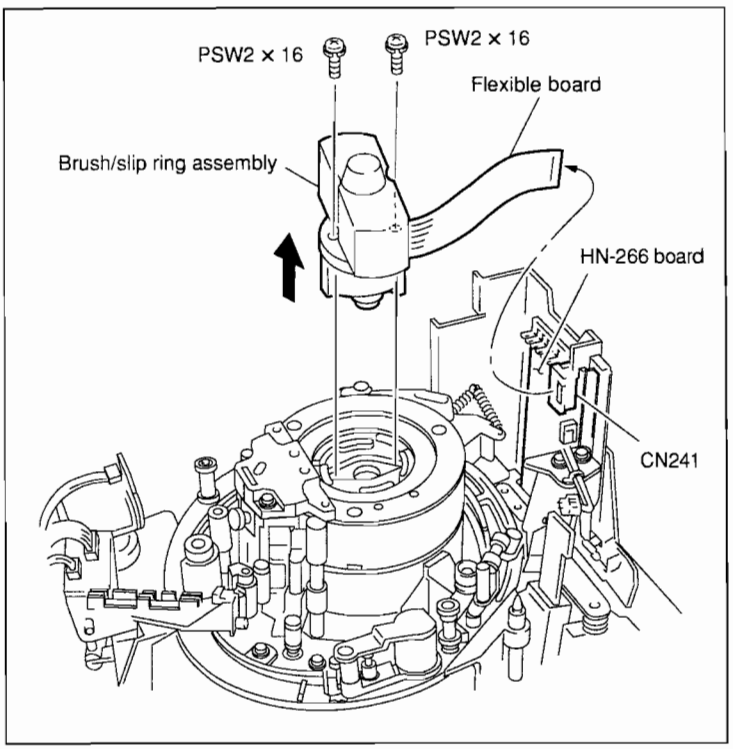
Disconnect the flexible board from connector CN241 on the HN-266 board.

3. Remove the Brush/Slip Ring Assembly

Remove the two screws, then remove the brush/slip ring assembly.

CAUTION

- Do not apply excessive force to the brush/slip ring assembly at that time.
- If the screws remain put into the screw holes of the brush/slip ring assembly, remove them once.
  When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



Brush/Slip Ring Assembly Removal

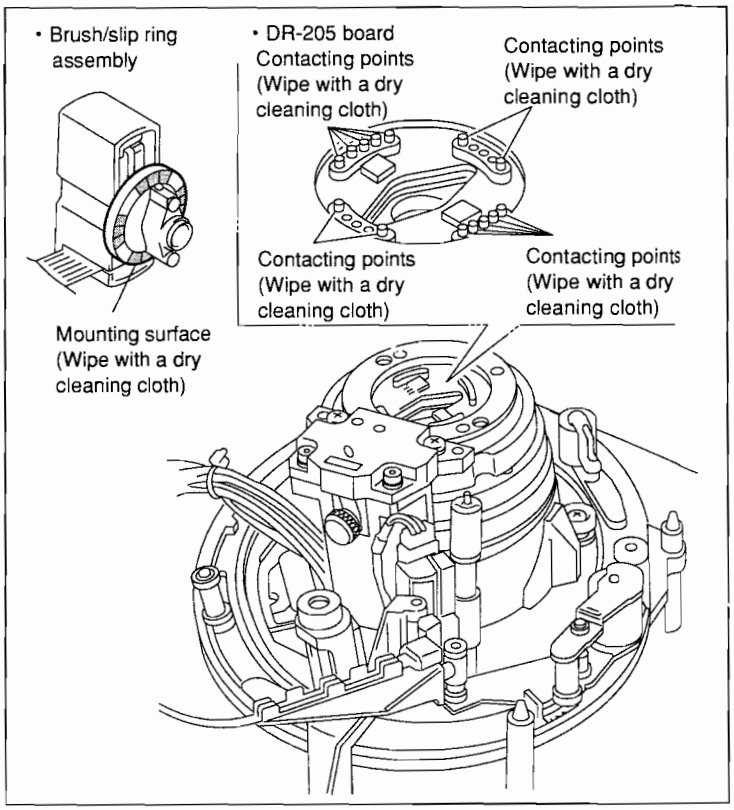
Installation

4. Cleaning

Wipe the brush/slip ring assembly mounting surface (shaded portion in the figure) and the DR-205 board contacting points with a dry cleaning cloth.

Note

Do not apply cleaning fluid to the contacting points.


• Brush/slip ring assembly
• DR-205 board
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)
Mounting surface (Wipe with a dry cleaning cloth)

Cleaning

5. Install the Brush/Slip Ring Assembly

(1) Insert the two screws taken out in step 3 into the screw holes of the brush/slip ring assembly.

(2) Install the brush/slip ring assembly in the direction shown in the figure.

(3) Tighten the two screws alternately and gradually while pushing both sides of the flange equally from above.

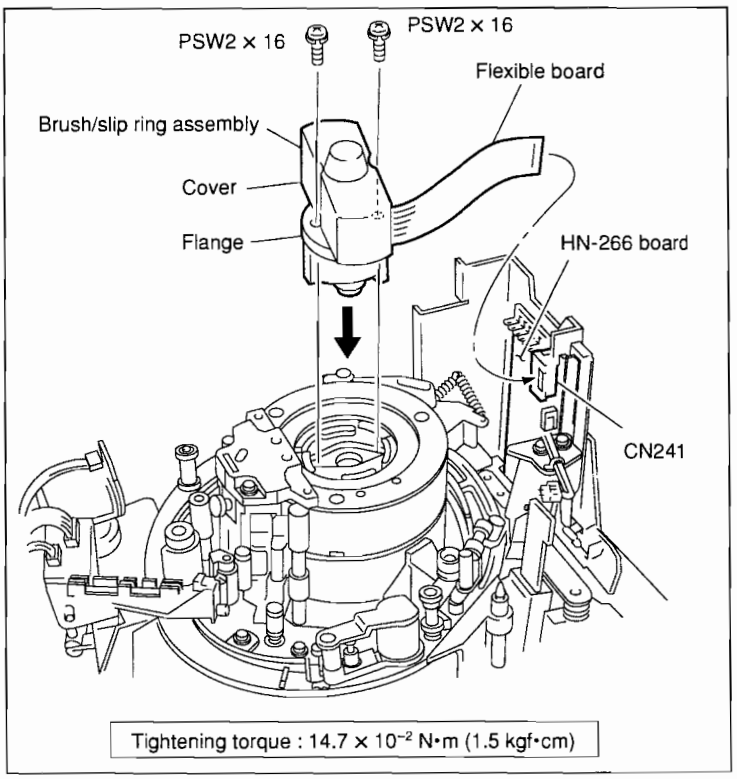
Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

Note

Never apply excessive force to the cover.

6. Connect the Flexible Board

Connect the flexible board into connector CN241 on the HN-266 board.



Brush/Slip Ring Assembly Installation

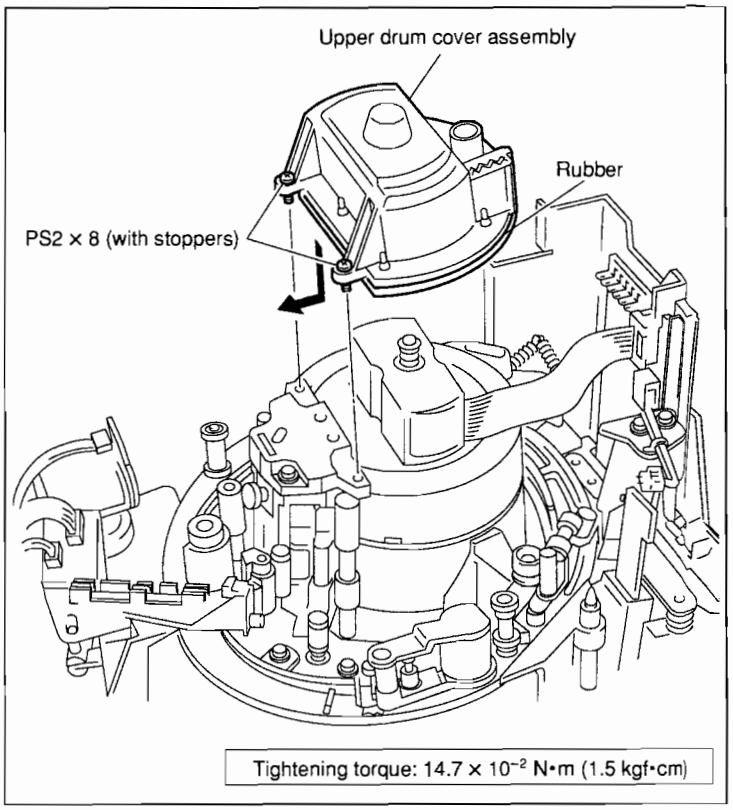
7. Install the Upper Drum Cover Assembly

(1) Tighten the two screws while pushing the upper drum cover assembly toward the height determining plate.

Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

(2) Confirm that the rubber of the upper drum cover assembly does not turn over.

(3) Confirm that the no clearance between the upper drum cover assembly and the upper drum.



Upper Drum Cover Assembly Installation

Adjustment after Replacement

8. Perform the Servo/DT Check

Refer to section 4-3-3 in maintenance manual part 1.
(F 1 : DT DRIVER/F 2 : SG LOOP/F 3 : WOBBLING)

9. Perform the RF Check

Refer to section 4-3-4 in maintenance manual part 1.
(F 7 : RF CHECK)

5-4. Drum Assembly Replacement

Replace the drum assembly every 3,000 hours of drum rotation.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Remove the Upper Drum Cover Assembly
3. Disconnect the Flexible Board (CN241/HN-266 board)
4. Remove the Drum Assembly
5. Cleaning (Drum Assembly Mounting Surfaces and Chassis Mounting Surfaces)
6. Install the Drum Assembly
7. Connect the Flexible Board (CN241/HN-266 Board)
8. Cleaning (Rotary heads, Upper Drum's Tape Running Surface, and Lower Drum's Tape Running Surface)
9. Install the Upper Drum Cover Assembly
10. Install the Video Head Cleaner Assembly

Adjustment after Replacement

11. Confirm the Drum Motor Operation
    (Refer to section 4-3-2. 2 in maintenance manual part 1.)
    ([F 1] : DRUM MOTOR)
12. Adjust the Tape Running (Refer to section 6-1-2.)
13. Adjust the Video Tracking (Refer to section 6-1-3.)
14. Adjust the CTL Head Height (Refer to section 6-1-4.)
15. Adjust the CTL Head Position (Refer to section 6-1-5.)
16. Adjust the AT Head Height (Refer to section 6-1-6.)
17. Adjust the AT Head Azimuth (Refer to section 6-1-7.)
18. Confirm the AT Head Head-to-Tape Contact (Refer to section 6-1-8.)
19. Adjust the AT Head Position (Refer to section 6-1-9.)
20. Confirm the CUE Level in REV Mode (Refer to section 6-1-10.)
21. Confirm the Tape Running (Refer to section 6-1-2.)
22. Adjust the RF Switching Position
    (Refer to section 4-4-1. 2 in maintenance manual part 1.)
    ([F 6] : RF SW AUTO)
23. Confirm the SAT Operation (Refer to section 4-3-3 in maintenance manual part 1.)
    ([F 7] : FUNC MODE)
24. Adjust the Drive Gain (Refer to section 4-4-2 in maintenance manual part 1.)
    ([F 4] : DRIVE GAIN)
25. Adjust the Head Offset Level (Refer to section 4-4-2 in maintenance manual part 1.)
    ([F 5] : HEAD OFFSET)
26. Adjust the RF (Refer to section 4-4-3. 1 in maintenance manual part 1.)
    ([F 4] : DRUM REPLACE)

Note

Be careful not to damage the AT head and peripheral tape guides when removing or installing the drum assembly.

Basic knowledge

For except the periodic replacement time, replace the drum assembly in the following cases.

- The upper or lower drum's tape running surface is damaged and cannot be repaired.
- A correct RF signal waveform cannot be obtained due to the worn upper or lower drum even if the tracking adjustment is performed.
- The VTR performance deteriorates because of the noise or jitter caused by the bearing life.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to section 2-7 in maintenance manual part 1.)

Tools

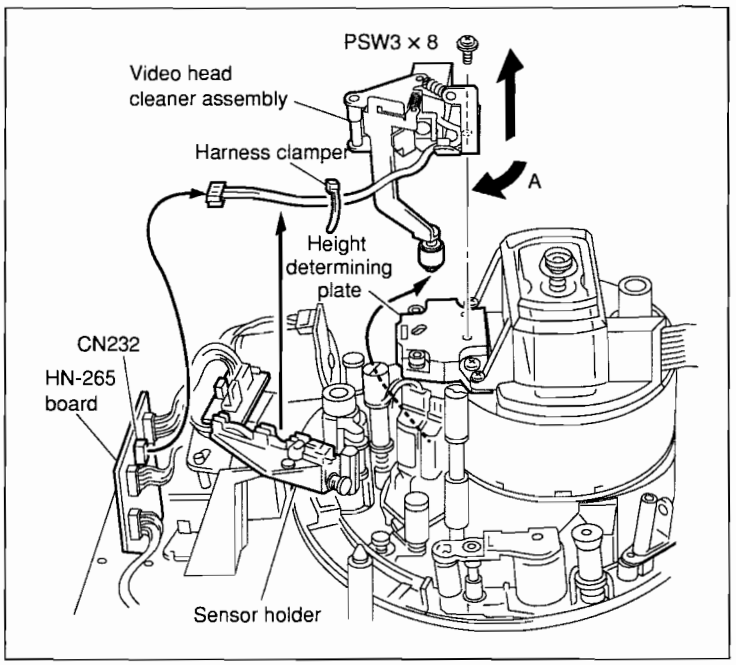
- Hexagonal wrench driver (2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver's hexagonal bit (D = 2.5 mm, L = 120 mm) : J-6251-090-A

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN232 on the HN-265 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determining plate.



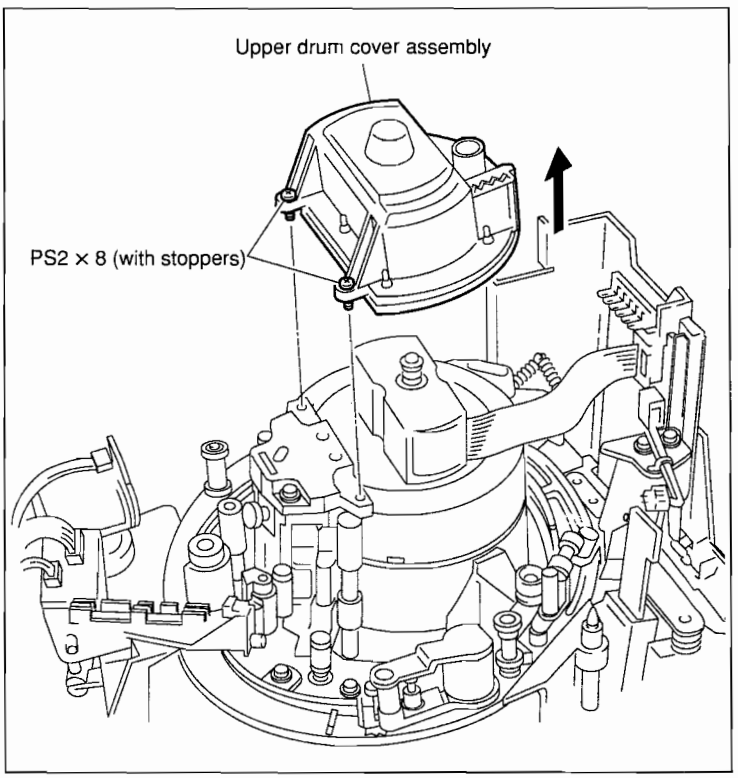
Video Head Cleaner Assembly Removal

2. Remove the Upper Drum Cover Assembly

Loosen the two screws and remove the upper drum cover assembly.

Note

These screws cannot be removed because of stoppers.



Upper Drum Cover Assembly Removal

3. Disconnect the Flexible Board

Disconnect the flexible board from connector CN241 on the HN-266 board.

4. Remove the Drum Assembly

(1) Rotate the inner drum assembly manually counterclockwise and align mark "⇨" indicated on the board cover with the screw hole of the upper drum assembly.

Note

The drum assembly is fixed to the chassis with the three fixing screws (C3 × 8) in the screw hole.

The screw hole of the upper drum assembly coincides with the fixing screw position by aligning it with mark "⇨" on the board cover.

(2) Loosen the screw fully using a hexagonal wrench driver.

Note

These screws cannot be removed because of stoppers.

(3) Loosen other two screws fully in the same way as in steps (1) and (2).

(4) Raise the drum assembly just above and remove the harness from the harness holders at the bottom.

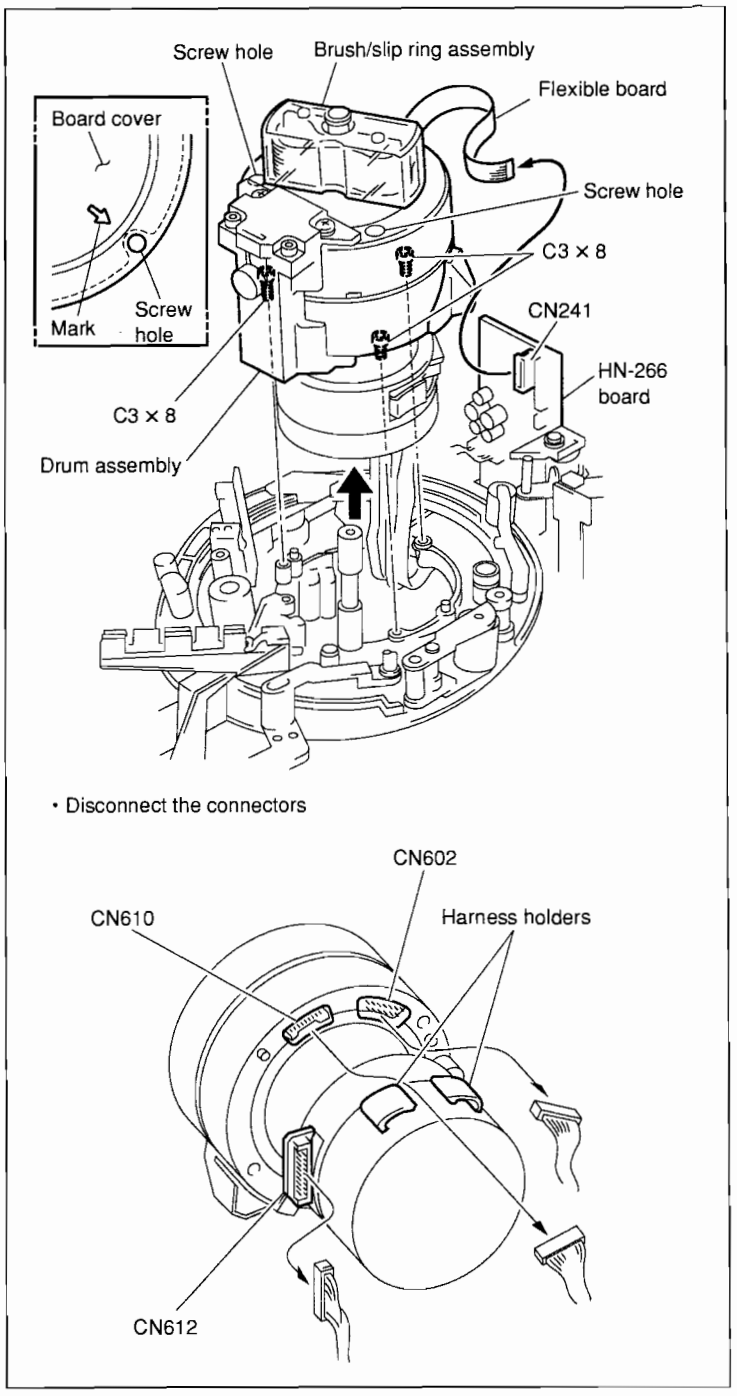
Note

Be careful not to raise the drum assembly by holding the brush/slip ring assembly.

(5) Disconnect the three connectors CN602, CN610 and CN612 in the state of step (4).

Note

When removing the drum assembly, be very careful not to hit the drum assembly against the AT head or tape guides.



Drum Assembly Removal

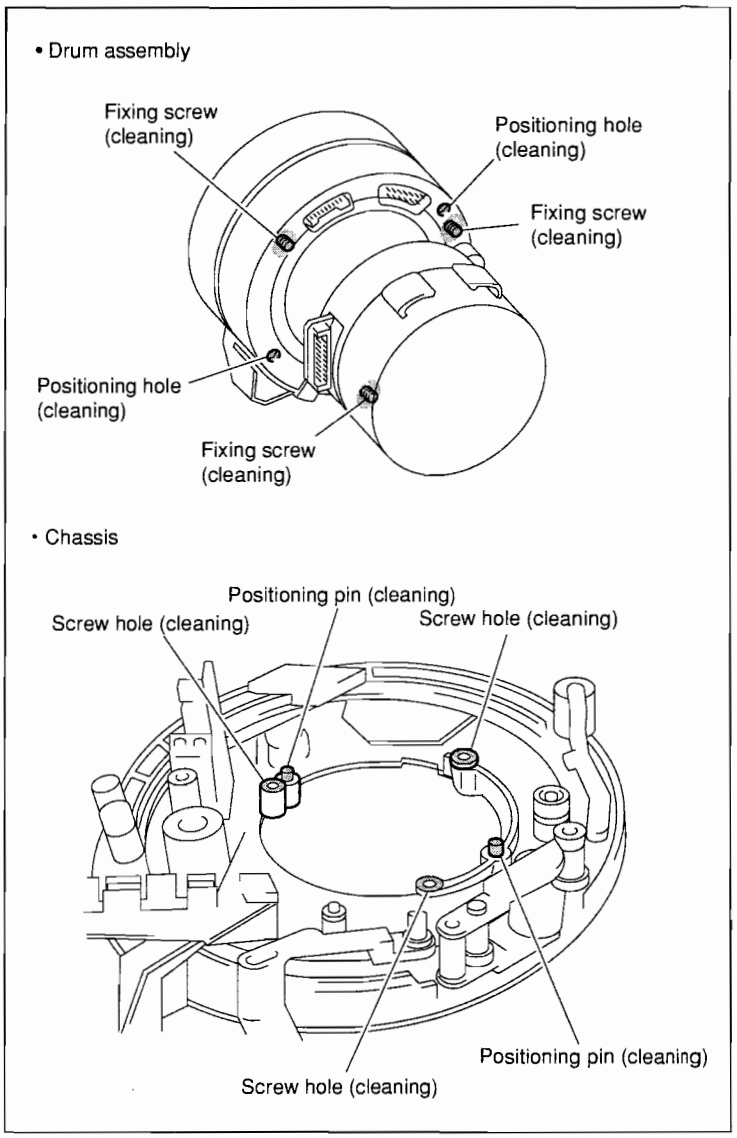
Installation

5. Cleaning

Clean the new drum assembly mounting surfaces and chassis mounting surfaces with a cleaning cloth moistened with cleaning fluid.

Note

After adjustment, wipe with a dry cleaning cloth.



Cleaning

6. Install the Drum Assembly

(1) Hold the drum assembly as shown in the figure and connect the three connectors disconnected in (5) of step 4.

Notes

- Hold the height determining plate and the drum support at that time. Be careful not to hold the upper drum, brush/slip ring assembly.
- Pay attention to the direction of the connectors.

(2) Fix the harness by a harness holder as shown in the figure.

(3) Align the two positioning holes of the drum assembly with the two positioning pins of the chassis while passing the harness under the chassis.

Notes

- Be careful not to hit the drum assembly against the AT head or tape guides.
- Be careful not to put the harness between the lower drum and the chassis.

(4) Confirm that the drum assembly is firmly inserted into the positioning pins.

(5) Rotate the inner drum assembly manually counterclockwise and align mark "⇨" indicated on the board cover with the screw hole of the upper drum assembly.

(6) Tighten the screw temporarily.

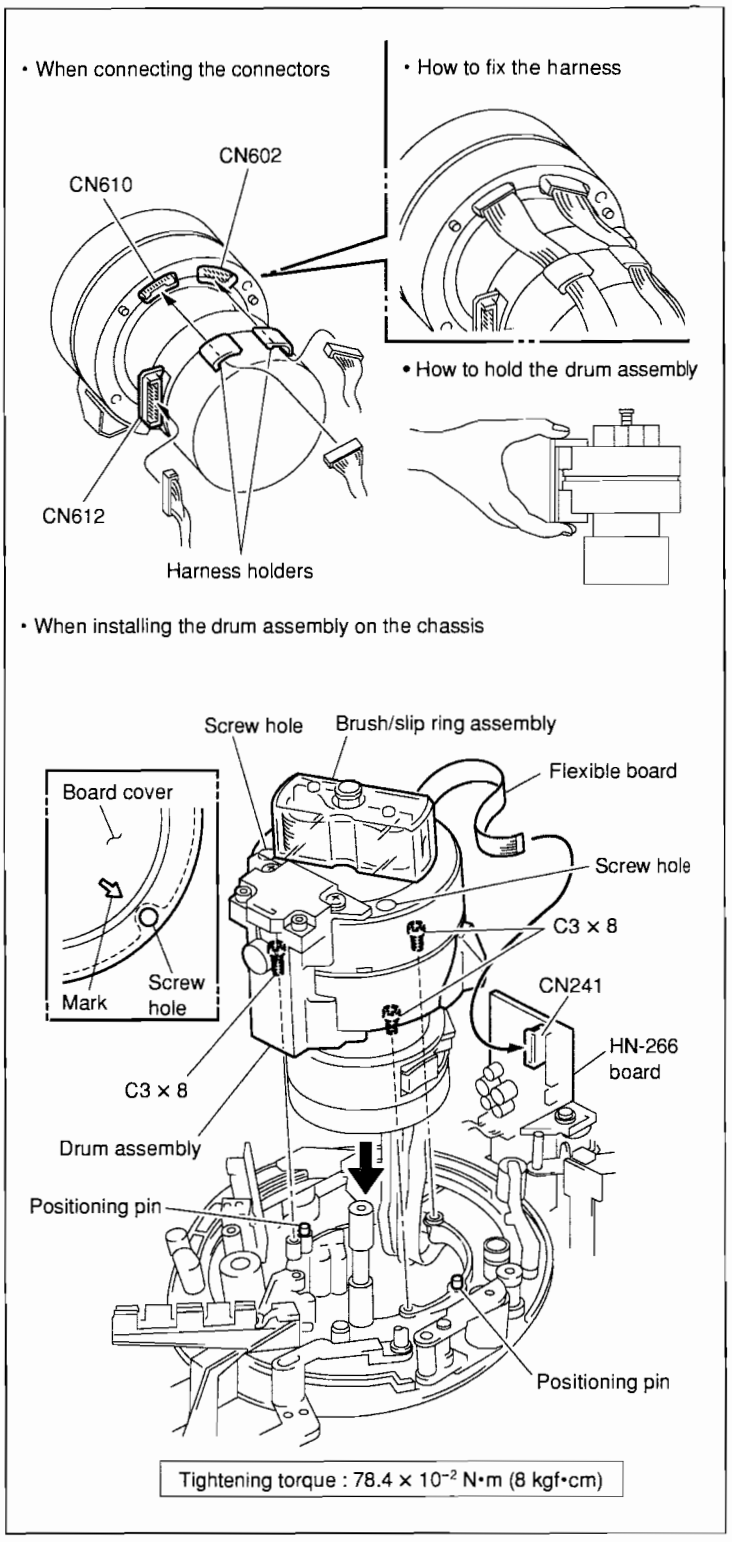
(7) Tighten other two screws tentatively in the same way as in steps (5) and (6).

(8) Gradually tighten the three screws each by two or three times' installments in the order of clockwise.

Tightening torque : 78.4×10^{-2} N•m (8 kgf•cm)

7. Connect the Flexible Board

Connect and lock the flexible board to connector CN241 on the HN-266 board.



Drum Assembly Installation

8. Cleaning

Make a cleaning of the following sections :

(1) Rotary head (Refer to section 5-2-3 in maintenance manual part 1.)
(2) Upper drum's tape running surface (Refer to section 5-2-4 in maintenance manual part 1.)
(3) Lower drum's tape running surface (Refer to section 5-2-5 in maintenance manual part 1.)

Note

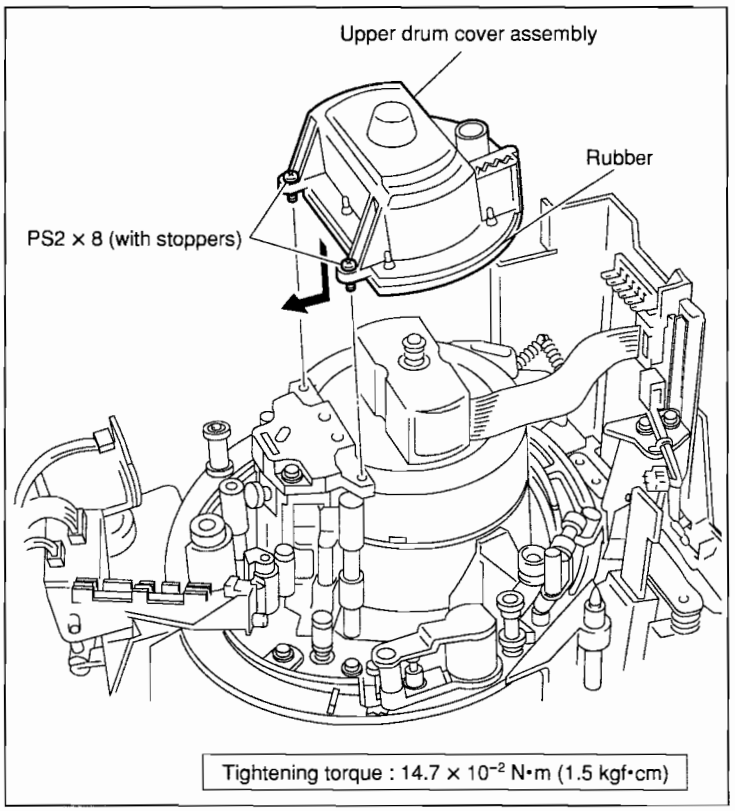
After cleaning, wipe with a dry cleaning cloth.

9. Install the Upper Drum Cover Assembly

(1) Tighten the two screws while pushing the upper drum cover assembly toward the height determining plate.

Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

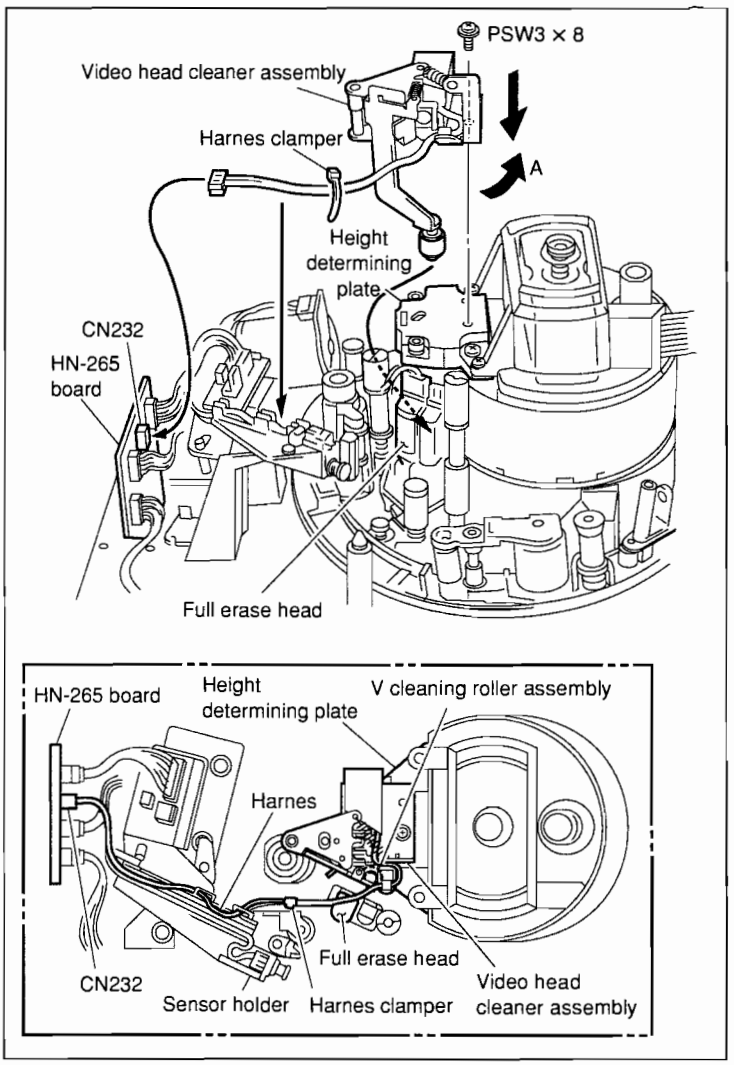
(2) Confirm that the rubber of the upper drum cover assembly does not turn over.
(3) Confirm that the no clearance between the upper drum cover assembly and the upper drum.



Upper Drum Cover Assembly Installation

10. Install the Video Head Cleaner Assembly

(1) Insert the V cleaning roller assembly into the clearance between the height determining plate and full erase head as shown in the figure.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determining plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the sensor holder position shown in the figure.
(5) Connect the connector to CN232 on the HN-265 board.
(6) Bind the CTL/full erase head harness and the video head cleaner assembly harness with harness clamper (or the equivalent).



Video Head Cleaner Assembly Installation

Adjustment after Replacement

11. Confirm the Drum Motor Operation

Refer to section 4-3-2. 2 in maintenance manual part 1.
(F 1 : DRUM MOTOR)

12. Adjust the Tape Running

Refer to section 6-1-2.

13. Adjust the Video Tracking

Refer to section 6-1-3.

14. Adjust the CTL Head Height

Refer to section 6-1-4.

15. Adjust the CTL Head Position

Refer to section 6-1-5.

16. Adjust the AT Head Height

Refer to section 6-1-6.

17. Adjust the AT Head Azimuth

Refer to section 6-1-7.

18. Confirm the AT Head Head-to-Tape Contact

Refer to section 6-1-8.

19. Adjust the AT Head Position

Refer to section 6-1-9.

20. Confirm the Audio Level in REV Mode

Refer to section 6-1-10.

21. Confirm the Tape Running

Refer to section 6-1-2.

22. Adjust the RF Switching Position

Refer to section 4-4-1. 2 in maintenance manual part 1.
(F 6 : RF SW AUTO)

23. Confirm the SAT Operation

Refer to section 4-3-3 in maintenance manual part 1.
(F 7 : FUNC MODE)

24. Adjust the Drive Gain

Refer to section 4-4-2 in maintenance manual part 1.
(F 4 : DRIVE GAIN)

25. Adjust the Head Offset Level

Refer to section 4-4-2 in maintenance manual part 1.
(F 5 : HEAD OFFSET)

26. Adjust the RF

Refer to section 4-4-3. 1 in maintenance manual part 1.
(F 4 : DRUM REPLACE)

5-5. Filter Replacement

Outline

Replacement

1. Remove the upper drum cover assembly
2. Remove the Cap
3. Replace the Filter
4. Install the Cap
5. Install the upper drum cover assembly

Note

Adjustment after the filter replacement is not required.

Tools

- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver bit (+2 mm, L = 75 mm) : J-6323-420-A

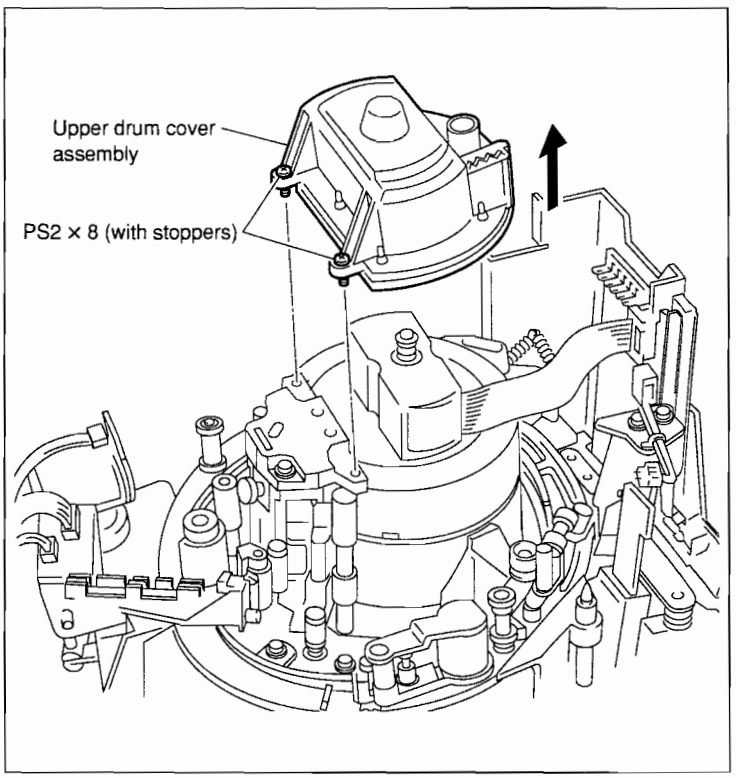
Replacement

1. Remove the Upper drum cover assembly

Loosen the two screws and remove the upper drum cover assembly.

Note

Two screws cannot be removed because of stoppers.



Filter Removal

2. Remove the Cap

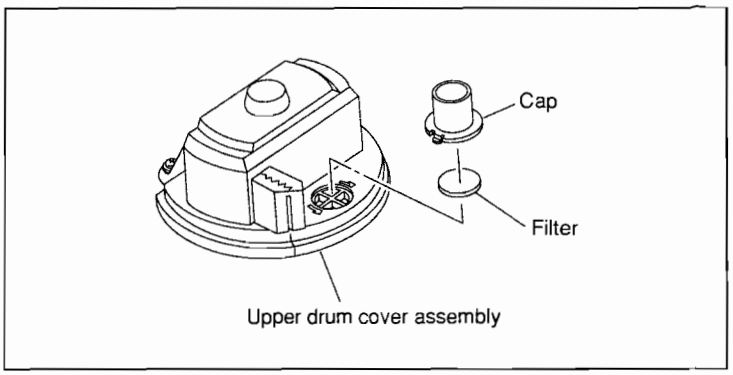
Turn the cap counterclockwise and remove it from the upper drum assembly.

3. Replace the Filter

Replace the dirty filter with fresh one.

4. Install the Cap

Turn the cap clockwise until it is clicked.



Filter Removal/Installation

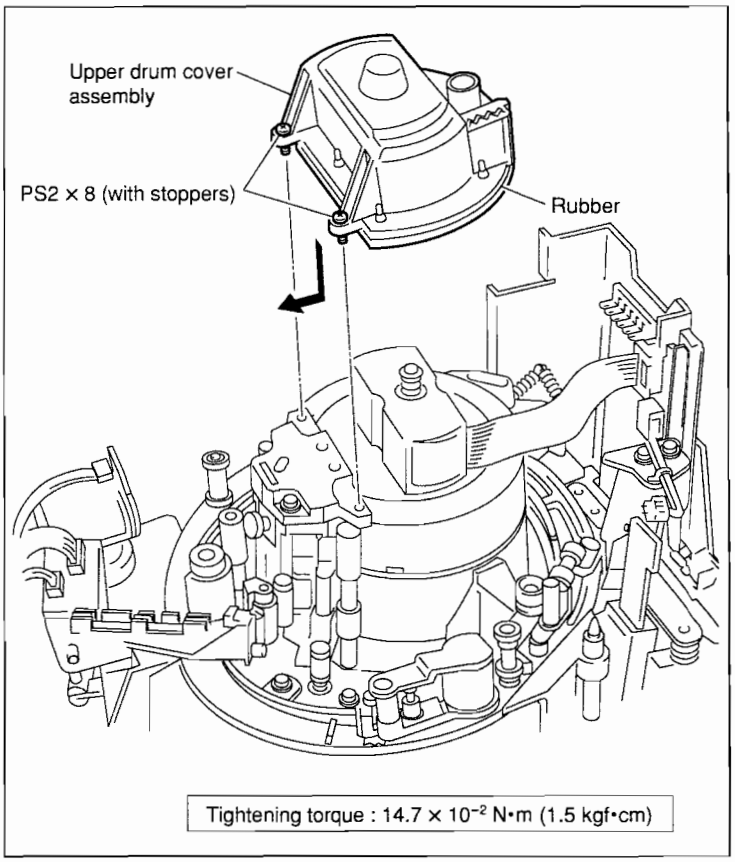
5. Install the Upper Drum Cover Assembly

(1) Tighten the two screws while pushing the upper drum cover assembly toward the height determining plate.

Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

(2) Confirm that the rubber of the upper drum cover assembly does not turn over.

(3) Confirm that there is no clearance between the upper drum cover assembly and the upper drum.



Upper Drum Cover Assembly Installation

5-6. V Cleaning Roller Assembly and Video Head Cleaner Assembly Replacement

Replace the V cleaning roller assembly every 1,000 hours of the drum rotation.
Replace the video head cleaner assembly every 3,000 hours of the drum rotation.
The V cleaning roller assembly is included in the video head cleaner assembly.

Outline

Replacement

1. Remove the Harness (CN232/HN-265board)
2. Remove the Video Head Cleaner Assembly
3. Replace the V Cleaning Roller Assembly
4. Install the Video Head Cleaner Assembly
5. Adjust the V Cleaning Roller Assembly Position
6. Install the Harness (CN232/HN-265board)

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation
   (Refer to section 4-3-2. 2 in maintenance manual part 1.)
   ([F 6] : CLEANING ROLLER)

Note

When the V cleaning roller assembly will be replaced, it is recommended to replace the CR spacer at the same time.
CR spacer : 3-182-765-02

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Removal

1. Remove the Harness

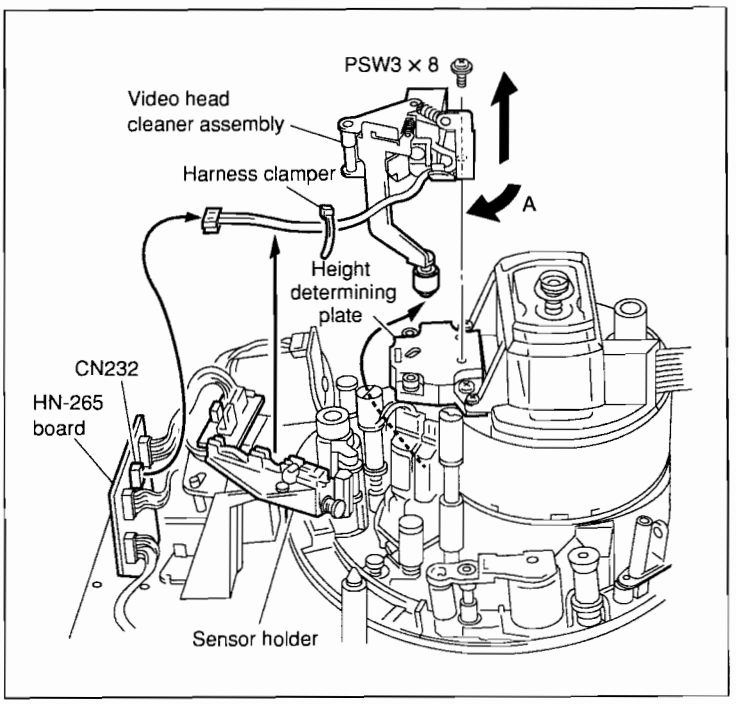
(1) Disconnect the connector from connector CN232 on the HN-265 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.

2. Remove the Video Head Cleaner Assembly

Remove the screw, shift the video head cleaner assembly in the arrow A direction, and remove it from the height determining plate.

Note

Be sure to perform step 4 and later when performing the video head cleaner assembly replacement. Perform steps 3 and later when the V cleaning roller assembly will be replaced.



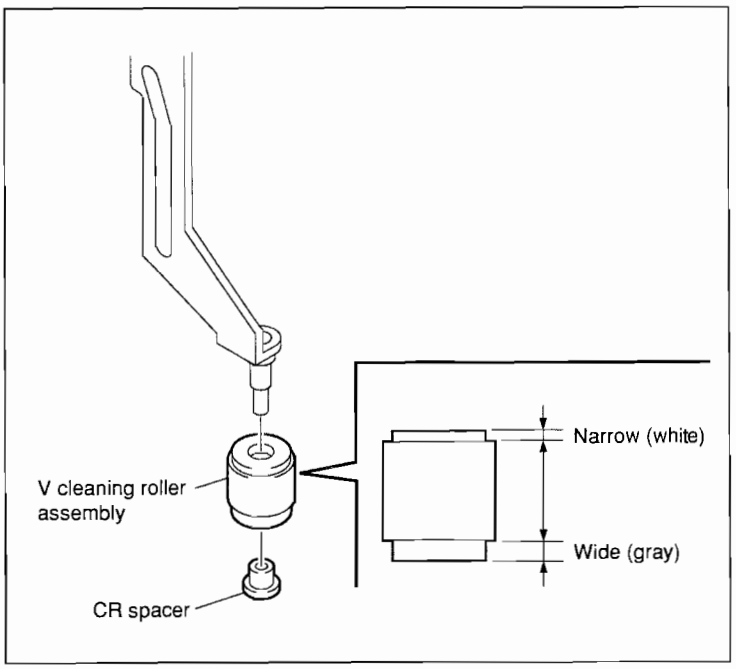
Video Head Cleaner Assembly Removal

3. Replace the V Cleaning Roller Assembly

(1) Remove the CR spacer, and remove the V cleaning roller assembly.
(2) Pass a new V cleaning roller assembly through the shaft as shown in the figure. Then fix the cleaning roller by new CR spacer.
(3) Gradually move the V cleaning roller assembly in the vertical direction, and check that there is no vertical play.

Note

Do not reverse the direction of the cleaning roller. The height between the cleaning roller and head is shifted in this case.



V Cleaning Roller Assembly Replacement

Installation

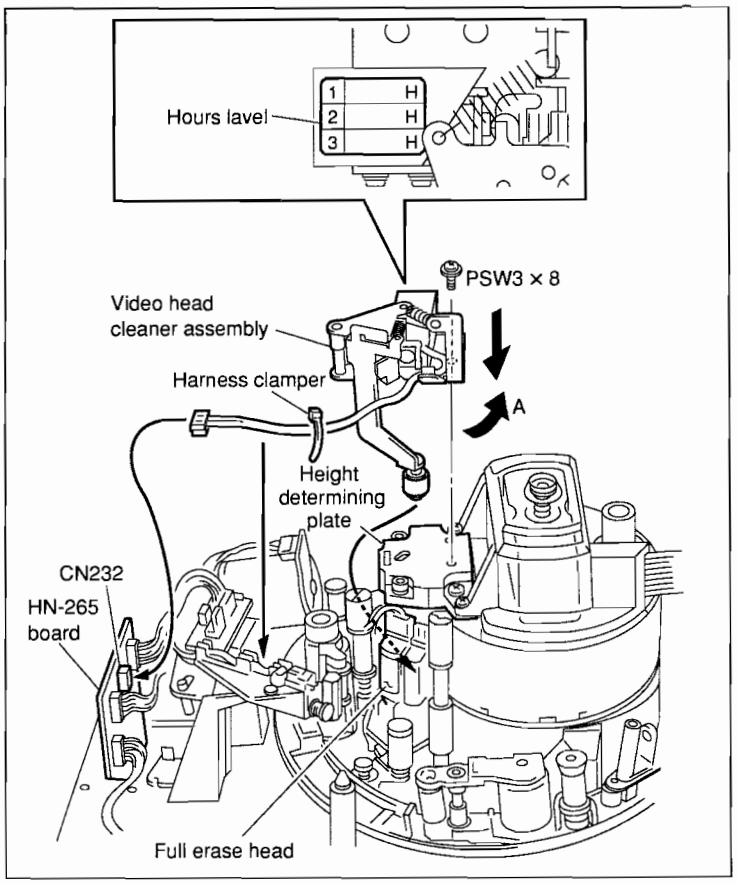
4. Install the Video Head Cleaner Assembly

(1) Insert the V cleaning roller assembly into the clearance between the height determining plate and the full erase head.

(2) Align the two pins of the video head cleaner assembly with the two holes of the height determining plate.

(3) Tighten the screw while pushing the video head cleaner assembly in the arrow A direction.

(4) Fill out the replacement hours of the V cleaning roller assembly on the hours label which stuck on the video head cleaner assembly.



Video Head Cleaner Assembly Installation

5. Adjust the V Cleaning Roller Assembly Position

(1) Check that the V cleaning roller assembly does not come in contact with the upper drum or video head as visual. (Specification 1)

If the V cleaning roller assembly comes in contact with the upper drum or video head, bend the portion B of the arm plate assembly in the arrow C direction.

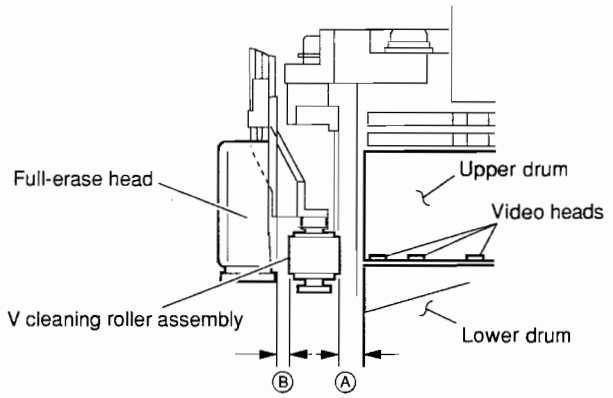
(2) Check that the V cleaning roller assembly does not come in contact with the terminal on the full erase head as visual. (Specification 2)

If the V cleaning roller assembly comes in contact with the terminal on the full erase head, bend the portion B of the arm plate assembly in the arrow D direction.

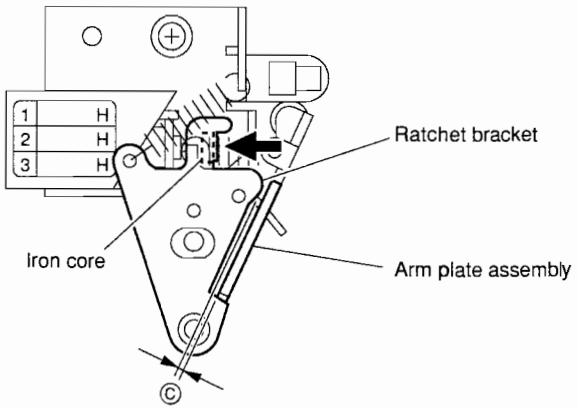
(3) Press the iron core in the arrow direction with tweezers. At that time, check that there is clearance between the ratchet bracket and the arm plate assembly. (Specification 3)

If there is no clearance, bend the portion B of the arm plate assembly in the arrow D direction.

(4) Repeat steps (1) through (3) above until the specifications 1 through 3 are met.

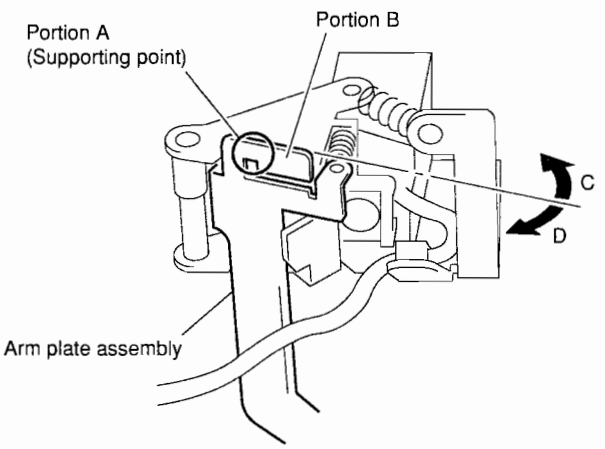


Spec. 1 : Ⓐ = Clearance exists.
Spec. 2 : Ⓑ = Clearance exists.



Spec. 3 : Ⓒ = Clearance exists.

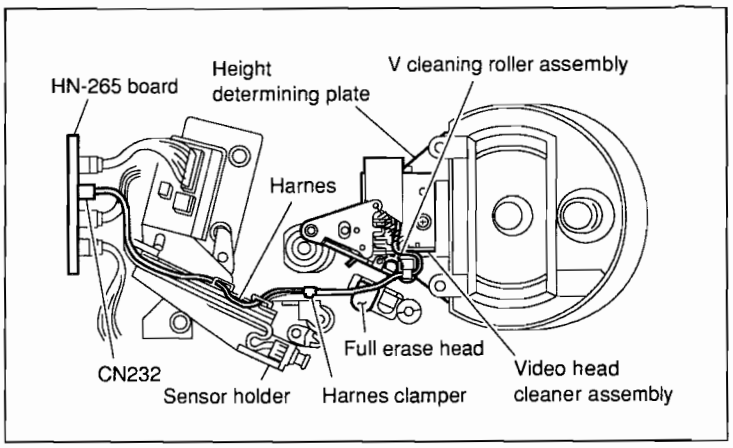
• When the specifications 1or 2 are not satisfied.



V Cleaning Roller Assembly Position Adjustment

6. Install the Harness

(1) Fix the harness to the sensor holder position shown in the figure.
(2) Connect a connector to CN232 on the HN-265 board.
(3) Bind the CTL/full erase head harness and the video head cleaner assembly harness with harness clamper or equivalent.



Harness Installation

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation

Refer to section 4-3-2. 2 in maintenance manual part 1.
(F 6 : CLEANING ROLLER)

5-7. AT Head Cleaner Replacement

Replace the AT head cleaner every 1,000 hours of drum rotation.

Outline

Replacement

1. Remove the CL Arm Assembly
2. Install the CL Arm Assembly
3. Confirm the CL Arm Assembly Operation

Note

- When the roller section of AT head cleaner is dirty or damaged, replace the CL arm assembly.
- Adjustment after the CL arm assembly replacement is not required. However, confirm the CL arm assembly operation.
- When replacing the CL arm assembly, prepare the following new stop washer.
  Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Removal

1. Remove the CL Arm Assembly

(1) Turn the M gear of the gear box assembly manually and move the CL arm assembly to the position shown in the figure.

Note

Move the CL arm assembly to the front of the HN-266 board. If not, the CL arm assembly cannot be removed because the stop washer is hidden by other parts.

(2) Remove the stop washer at the top of the CL arm assembly.

(3) Remove the CL arm assembly from the threading ring.

Note

Do not remove the spring at the bottom of the CL arm from the shaft.

Installation

2. Install the CL Arm Assembly

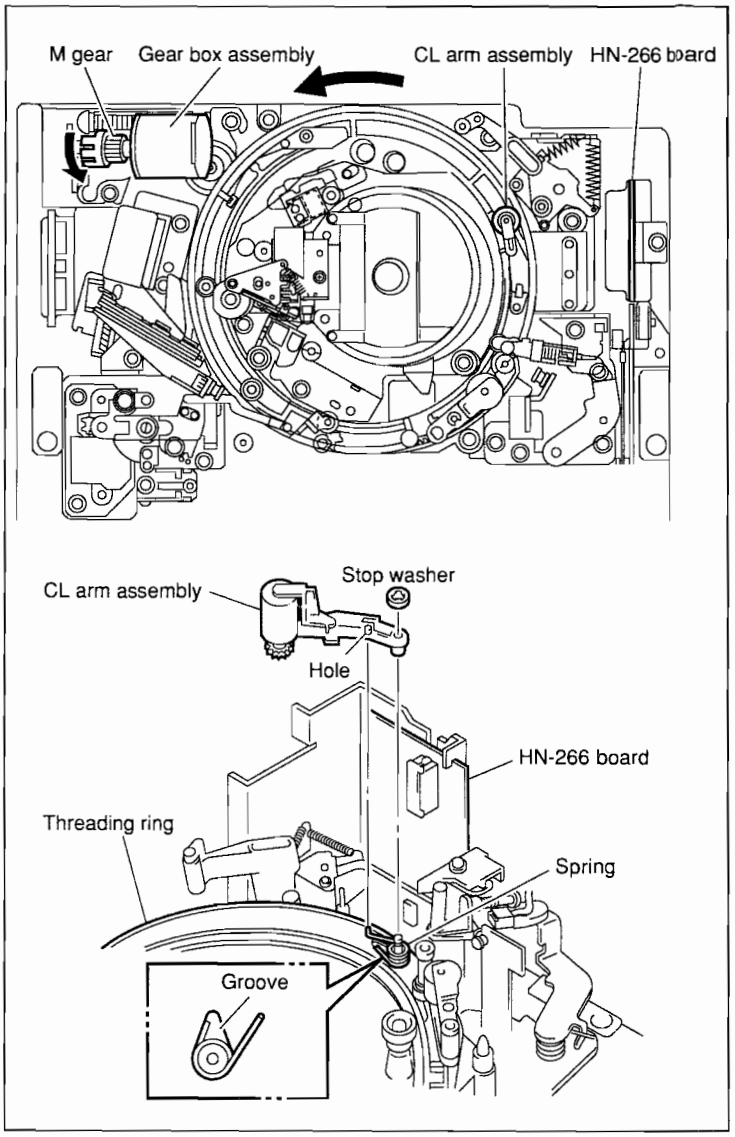
(1) Pass a new CL arm assembly through the shaft while hooking the spring as shown in the figure.

Note

Insert the short-end of the spring into the groove of the threading ring and the long-end spring into the hole of the CL arm assembly.

(2) Fix the CL arm assembly with new stop washer.

Stop washer (2.3) : 3-669-596-00



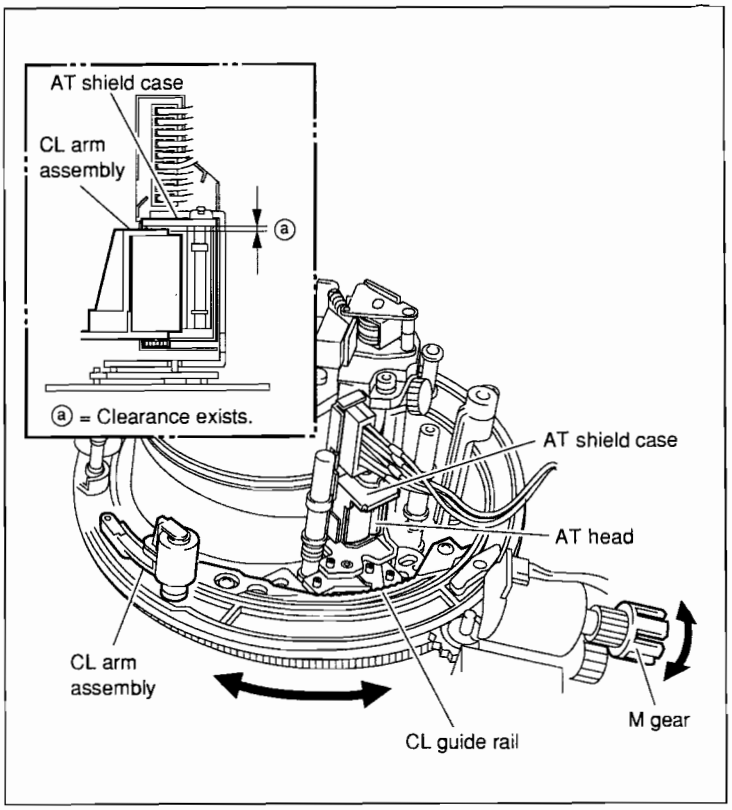
CL Arm Assembly Removal/Installation

3. Confirm the CL Arm Assembly Operation

(1) Turn the M gear of the gear box assembly manually and confirm the items below while repeating the threading and unthreading.

- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the CL arm assembly and shield case while the AT head is cleaned.

(2) Turn the power on and confirm that the CL arm assembly smoothly operates while repeating the threading and unthreading.



Confirm the CL Arm Assembly Operation

5-8. CTL Head Replacement

Replace the CTL head every 3,000 hours of tape running.

Outline

Replacement

1. Disconnect the Harness
2. Remove the CTL/FE Head Assembly
3. Remove the CTL Head
4. Install the CTL Head
5. Install the CTL/FE Head Assembly
6. Connect the Harness
7. Cleaning (CTL and Full-erase Heads Surface)

Adjustment after Replacement

8. Confirm Tape Running (Refer to section 6-1-2.)
9. Adjust the CTL Head Height (Refer to section 6-1-4.)
10. Adjust the CTL Head Position (Refer to section 6-1-5.)
11. Confirm Tape Running (Refer to section 6-1-2.)
12. Confirm the AT Head Position (Refer to section 6-1-9.)
13. Adjust the RF Switching Position
    (Refer to section 4-4-1. 2 in maintenance manual part 1.)
    (F 6 : RF SW AUTO)
14. Confirm the SAT Operation
    (Refer to section 4-3-3 in maintenance manual part 1.)
    (F 7 : FUNC MODE)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver's bit (+2 mm, L = 75 mm) : J-6323-420-A

Removal

1. Disconnect the Harness

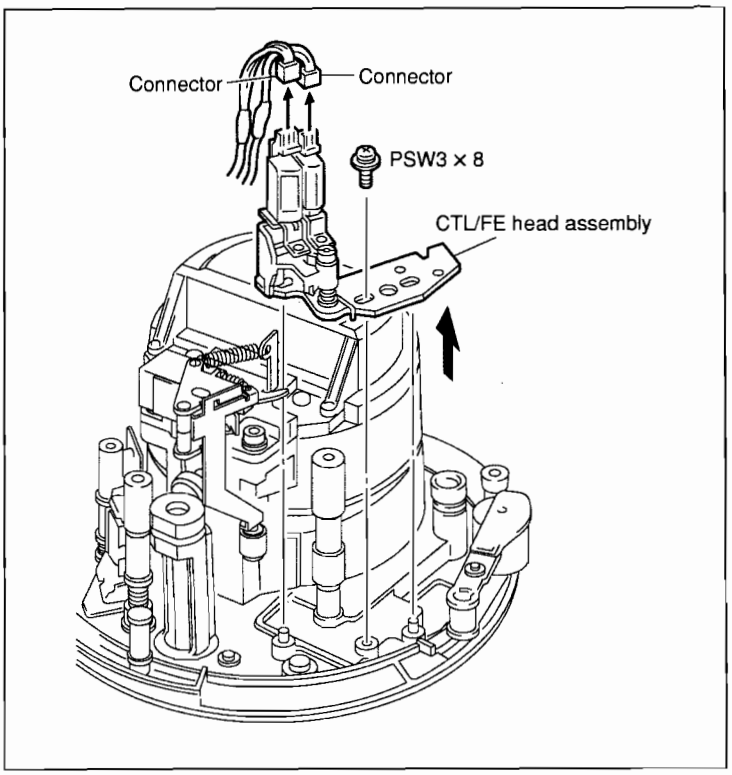
Disconnect the two harness from the connectors of CTL/FE head assembly.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



CTL/FE Head Assembly Removal

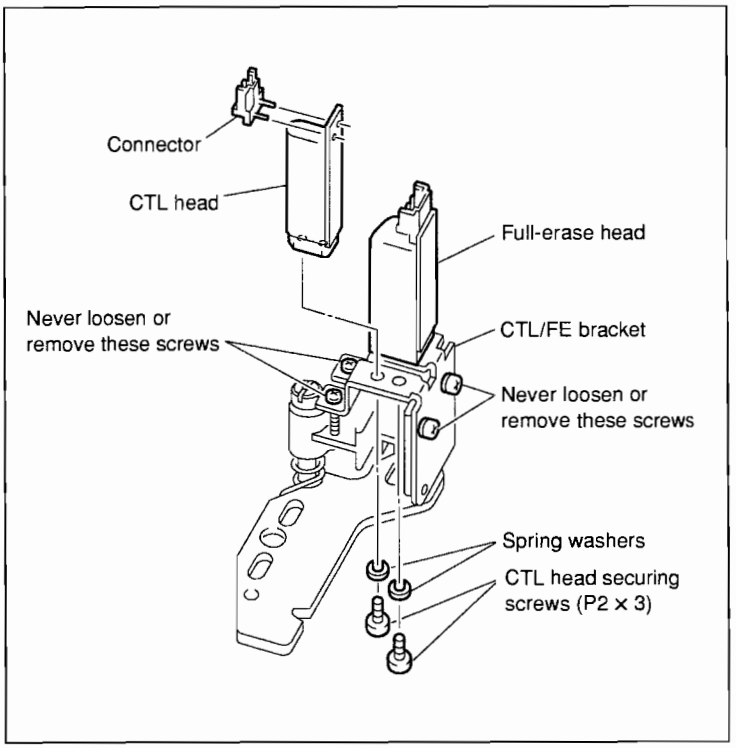
3. Remove the CTL Head

(1) Remove the two CTL head fixing screws, then remove the CTL head.

Notes

- When removing the CTL head, be careful not to damage the full erase head.
- Never loosen or remove the screws except for the CTL head securing screws. If these screws are loosened or removed, the zenith of the CTL and the full-erase head will be out of specification.

(2) Unsolder the connector pins on the CTL head board and remove the connector.



CTL Head Removal

Installation

4. Install the CTL Head

(1) Solder the connector pin to the CTL head board.

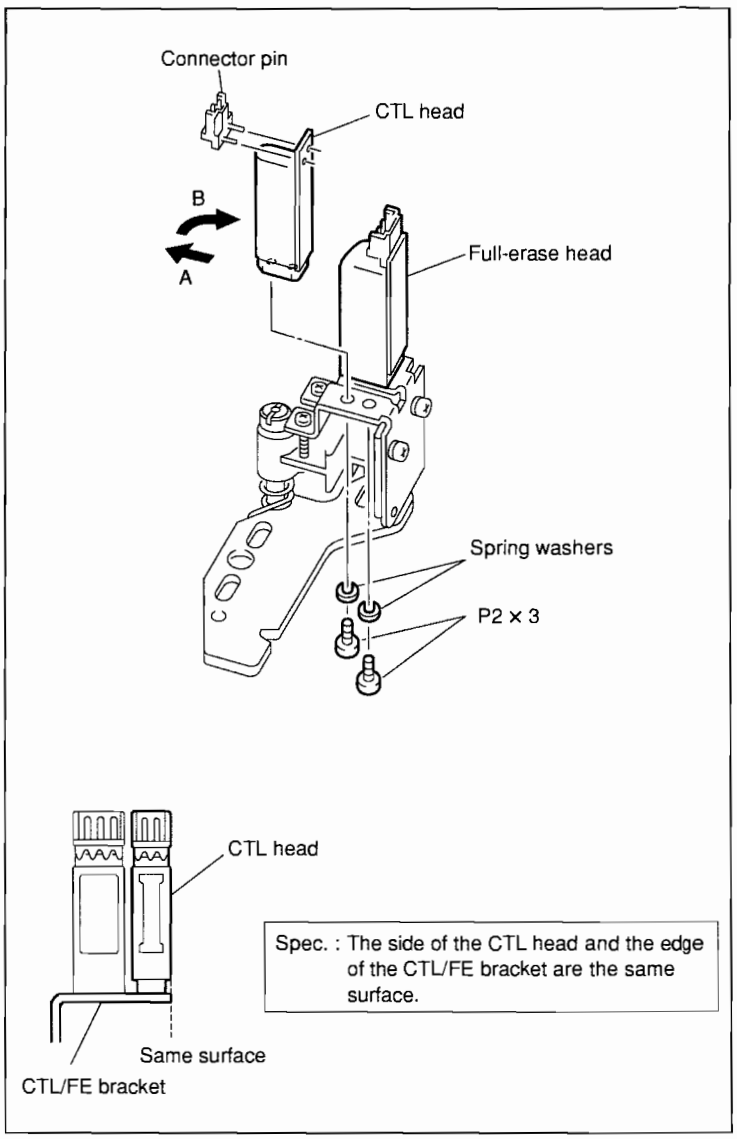
(2) Tighten the two screws temporarily while moving the CTL head in the direction indicated by arrows A and B.

Note

Be careful not to damage the CTL and full-erase head.

(3) Tighten the two screws if it is within the specification.

Tightening torque : 19.6×10^{-2} N•m (2.0 kgf•cm)



CTL Head Installation

5. Install the CTL/FE Head Assembly

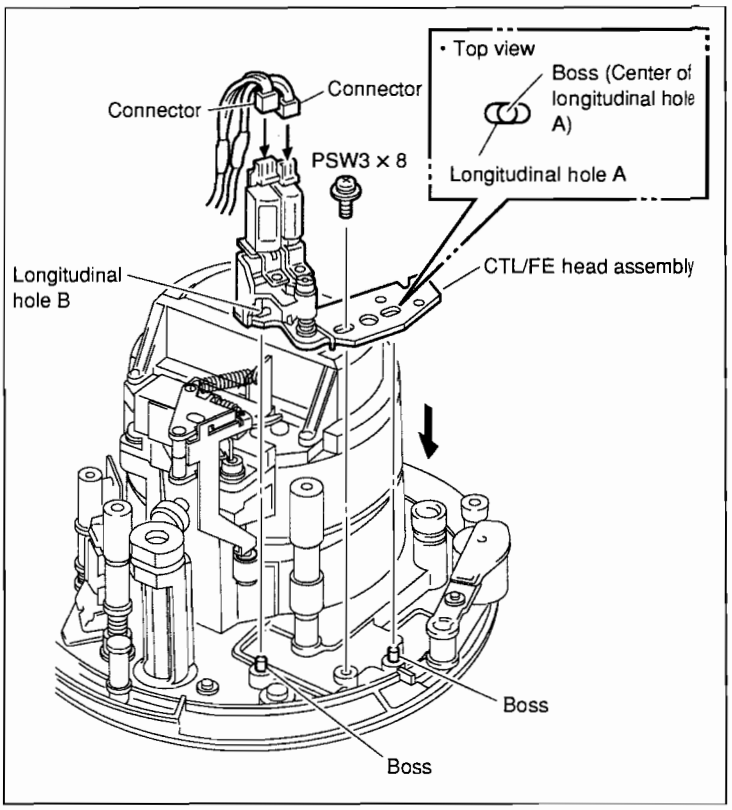
(1) Confirm that the threading ring is in the unthreading end state.

(2) Align the longitudinal holes A and B of the CTL/FE head assembly with the bosses of the chassis.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.

(3) Align the boss of the chassis with center of the longitudinal hole A and tighten the screw.



CTL/FE Head Assembly Installation

6. Connect the Harness

Connect the two harness into the connectors of CTL/FE head assembly.

7. Cleaning

Clean the tape running surfaces of the CTL head and the full erase head with a cleaning cloth moistened with cleaning fluid.
(Refer to section 5-2-6 in maintenance manual part 1.)

Adjustment after Replacement

8. Confirm the Tape Running

Refer to section 6-1-2.

9. Adjust the CTL Head Height

Refer to section 6-1-4.

10. Adjust the CTL Head Position

Refer to section 6-1-5.

11. Confirm the Tape Running

Refer to section 6-1-2.

12. Confirm the AT Head Position

Refer to section 6-1-9.

13. Adjust the RF Switching Position

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 6] : RF SW AUTO)

14. Confirm the SAT Operation

Refer to section 4-3-3 in maintenance manual part 1.
([F 7] : FUNC MODE)

5-9. Full-erase Head Replacement

Outline

Replacement

1. Disconnect the Harness
2. Remove the CTL/FE Head Assembly
3. Remove the Full-erase Head
4. Install the Full-erase Head
5. Install the CTL/FE Head Assembly
6. Connect the Harness
7. Cleaning (Surface of Full-erase Head and CTL Head)

Adjustment after Replacement

8. Adjust the Tape Running (Refer to section 6-1-2.)
9. Confirm the CTL Head Height (Refer to section 6-1-4.)
10. Adjust the CTL Head Position (Refer to section 6-1-5.)
11. Confirm the Tape Running (Refer to section 6-1-2.)
12. Confirm the AT Head Position (Refer to section 6-1-9.)
13. Adjust the RF Switching Position
    (Refer to section 4-4-1. 2 in maintenance manual part 1.)
    ([F 6] : RF SW AUTO)
14. Confirm the SAT Operation
    (Refer to section 4-3-3 in maintenance manual part 1.)
    ([F 7] : FUNC MODE)
15. Confirm the Full Erase Current (Refer to section 3-2-7.)
16. Confirm the Full Erase Head's Erasure Ratio (Refer to section 3-2-19.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver bit (+2 mm, L = 75 mm) : J-6323-420-A

Removal

1. Disconnect the Harness

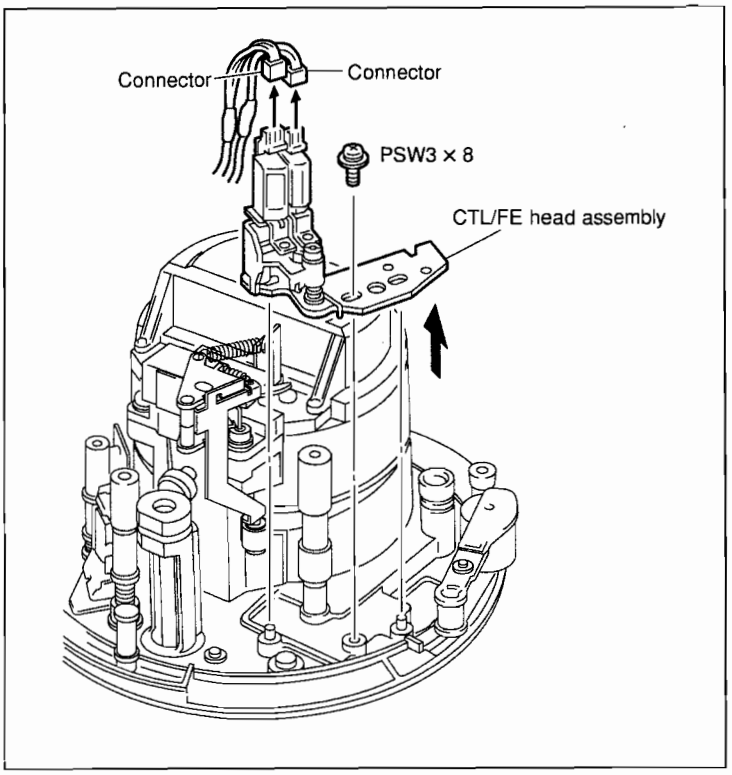
Disconnect the two harness from the connectors of CTL/FE head assembly.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.



CTL/FE Head Assembly Removal

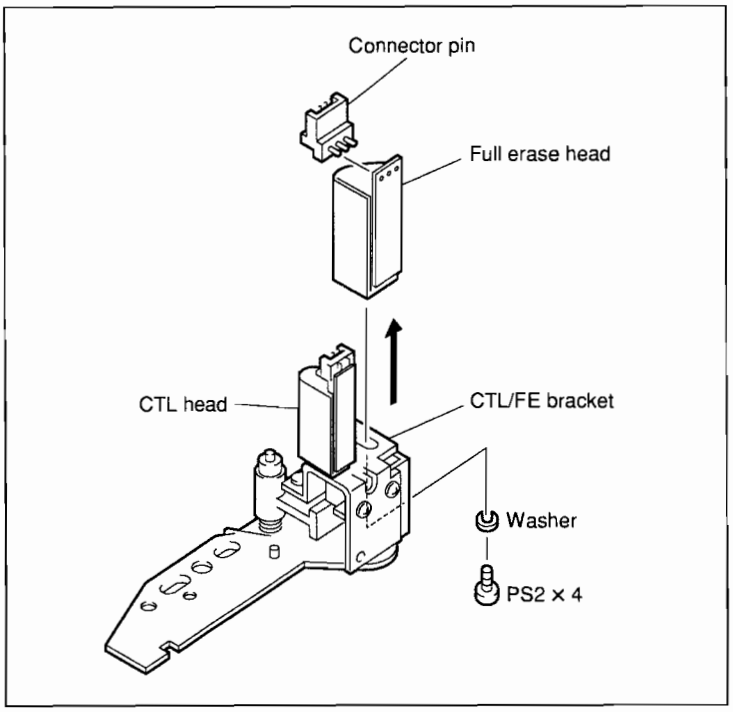
3. Remove the Full-erase Head

(1) Remove the screw and washer, then remove the full-erase head.

Notes

1. Be careful not to damage the CTL head when the full-erase head is removed.
2. Do not loosen or remove the two screws fixing the CTL/FE mounting table. This causes the deviation in the zenith of the CTL head and full-erase head.

(2) Unsolder the connector pins on the full-erase head board and remove the connector pin.



Full-erase Head Removal

Installation

4. Install the Full-erase Head

(1) Solder the connector pins to a new full-erase head board.

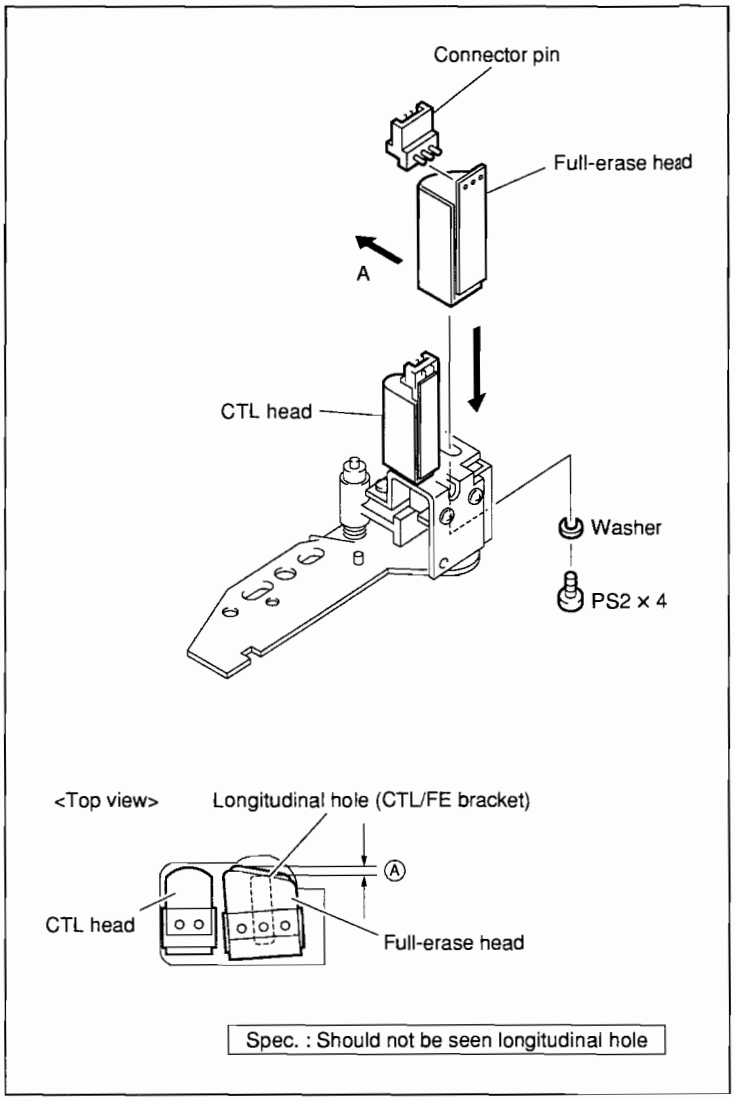
(2) Tighten the screw temporarily while moving the full-erase head in the direction indicated by arrow A.

Note

Be careful not to damage the full-erase head and CTL head.

(3) Confirm that the specification is satisfied and tighten the screw.

Tightening torque : 19.6×10^{-2} N•m (2.0 kgf•cm)



Full-erase Head Installation

5. Install the CTL/FE Head Assembly

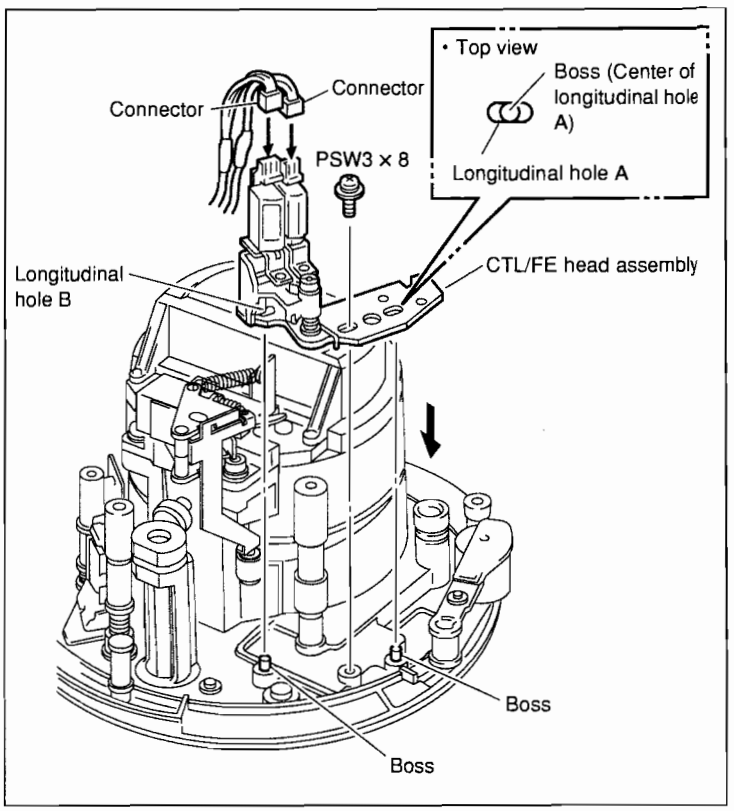
(1) Confirm that the threading ring is in the unthreading end state.

(2) Put longitudinal holes A and B of the CTL/FE head assembly into the bosses of the chassis.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.

(3) Place the boss of the chassis in the center of longitudinal hole A and tighten the screw.



CTL/FE Head Assembly Installation

6. Connect the Harness

Connect the two harness into the connectors of CTL/FE head assembly.

7. Cleaning

Clean the surface of the CTL head and full-erase head with cleaning cloth moistened with cleaning fluid.
(Refer to section 5-2-6 in maintenance manual part1.)

Adjustment after Replacement

8. Adjust the Tape Running

Refer to section 6-1-2.

9. Confirm the CTL Head Height

Refer to section 6-1-4.

10. Adjust the CTL Head Position

Refer to section 6-1-5.

11. Confirm the Tape Running

Refer to section 6-1-2.

12. Confirm the AT Head Position

Refer to section 6-1-9.

13. Adjust the RF Switching Position

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 6] : RF SW AUTO)

14. Confirm the SAT Operation

Refer to section 4-3-3 in maintenance manual part 1.
([F 7] : FUNC MODE)

15. Confirm the Full Erase Current

Refer to section 3-2-7.

16. Confirm the Full Erase Head's Erasure Ratio

Refer to section 3-2-19.

5-10. AT Head Replacement

Replace the AT head every 6,000 hours of tape running.

Outline

Replacement

1. Remove the CL Guide Rail
2. Disconnect the Harness
3. Remove the AT Head Assembly
4. Remove the AT Head
5. Install the AT Head
6. Install the AT Head Assembly
7. Connect the Harness
8. Install the CL Guide Rail
9. Cleaning (AT Head Surface)

Adjustment after Replacement

10. Adjust the AT Head Zenith (Refer to section 6-1-1.)
11. Adjust the Tape Running (Refer to section 6-1-2.)
12. Adjust the AT Head Height (Refer to section 6-1-6.)
13. Adjust the AT Head Azimuth (Refer to section 6-1-7.)
14. Adjust the AT Head Head-to-tape Contact (Refer to section 6-1-8.)
15. Adjust the AT Head Position (Refer to section 6-1-9.)
16. Confirm the Audio Level in REV Mode (Refer to section 6-1-10.)
17. Confirm the Video Tracking (Refer to section 6-1-3.)
18. Confirm the Tape Running (Refer to section 6-1-2.)
19. Adjust the RF Switching Position
    (Refer to section 4-4-1. 2 in maintenance manual part 1.)
    (F 6 : RF SW AUTO)
20. Confirm the SAT Operation
    (Refer to section 4-3-3 in maintenance manual part 1.)
    (F 7 : FUNC MODE)
21. Perform the Electrical Adjustment after AT Head Replacement (Refer to section 6-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

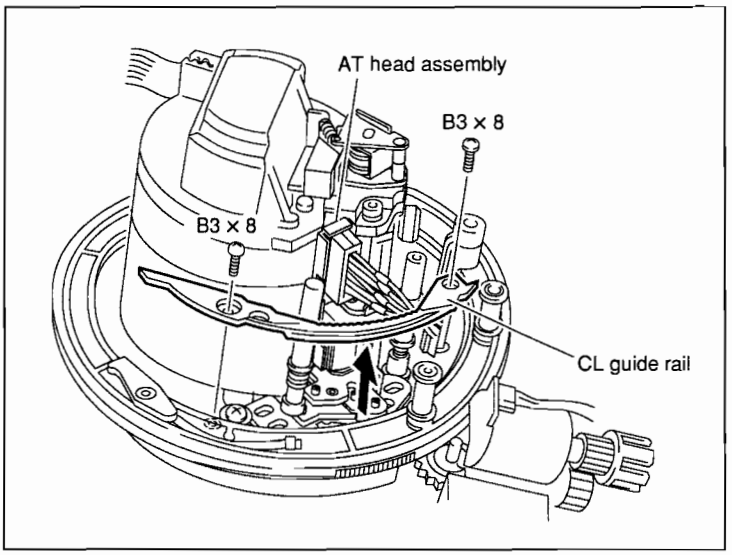
Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver's bit (+2 mm, L = 75 mm) : J-6323-420-A

Removal

1. Remove the CL Guide Rail

Remove the two screws, then remove the CL guide rail.



CL Guide Rail Removal

2. Disconnect the Harness

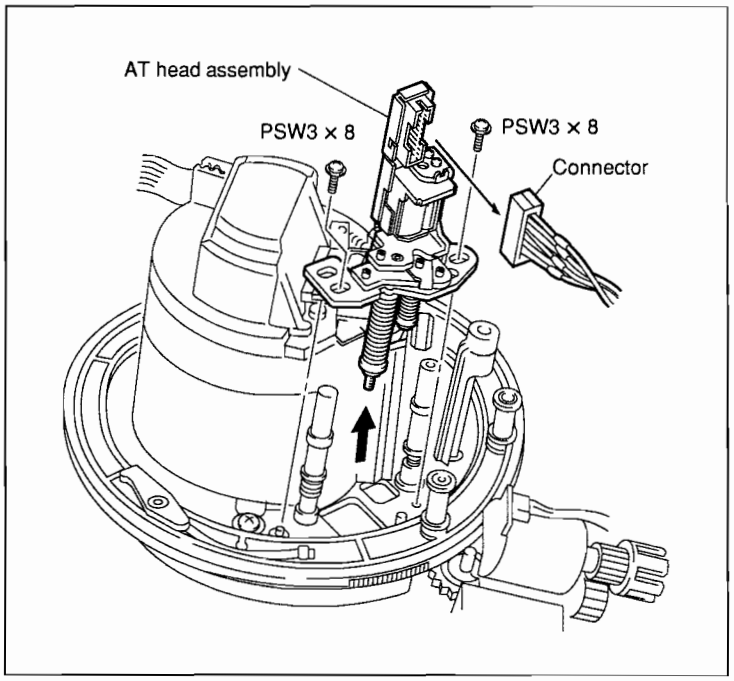
Disconnect a harness from the connector of AT head assembly.

3. Remove the AT Head Assembly

Remove the two screws, then remove the AT head assembly from the unit.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



AT Head Assembly Removal

4. Remove the AT Head

(1) Remove the two screws, then remove the AT head and adjustment plate from the AT bracket.
(2) Remove the AT shield case.
(3) Stretch the two claws for holding the AT shield plate with a pliers to remove the AT shield plate.

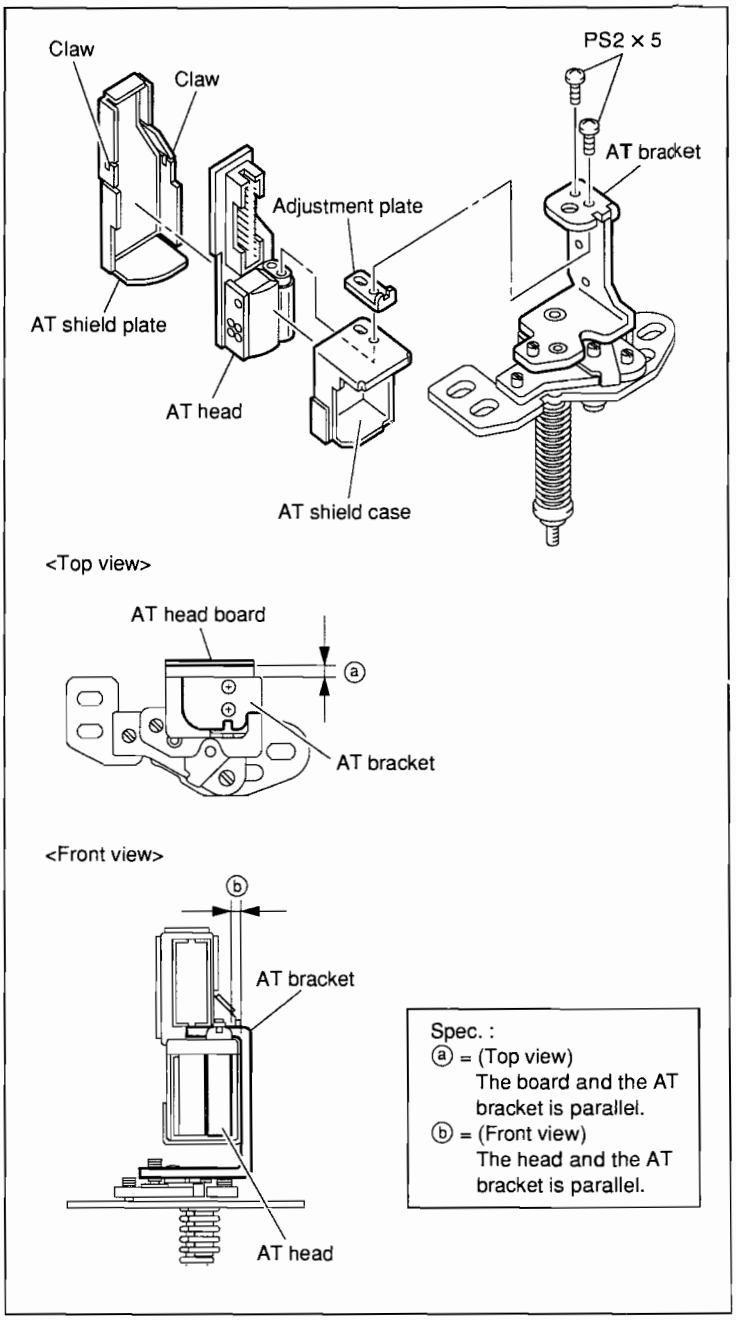
Installation

5. Install the AT Head

(1) Put a new head into the AT shield case and align the hole positions.
(2) Align the hole positions while putting the adjustment plate between the AT head and the AT bracket, then tighten the two screws temporarily.
(3) Tighten the screws after confirming that the specification is met.

Tightening torque : 19.6×10^{-2} N•m (2.0 kg•cm)

(4) Cover the AT shield plate on the AT head board. Then, fix the AT shield plate by bending the two claws using a plier.



AT Head Removal/Installation

6. Install the AT Head Assembly

(1) Align the two longitudinal holes of the AT head assembly with the two bosses of the chassis.

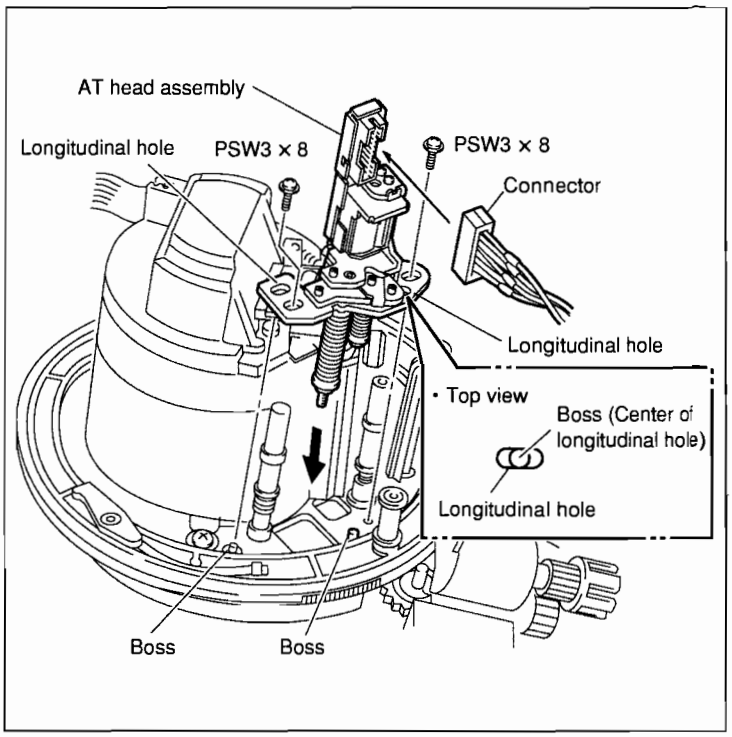
CAUTIONS

- Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.
- Be careful not to damage the AT head surface.

(2) Align the bosses of the chassis with center of the longitudinal holes and tighten the two screws.

7. Connect the Harness

Connect a harness into the connector of AT head assembly.



AT Head Assembly Installation

8. Install the CL Guide Rail

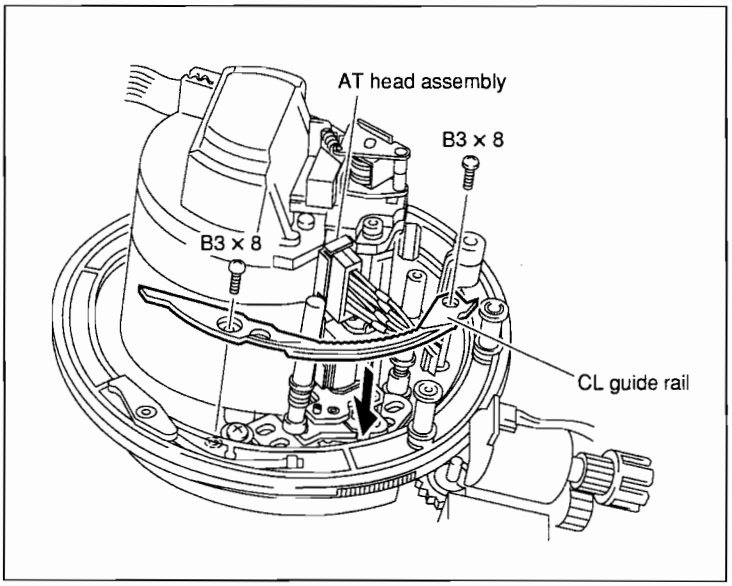
Install the CL guide rail with two screws.

9. Cleaning

Clean the AT head surface with a cleaning cloth moistened with cleaning fluid.
(Refer to section 5-2-6 in maintenance manual part 1.)

CAUTION

After cleaning, wipe with a dry cleaning cloth.



CL Guide Rail Installation

Adjustment after Replacement

10. Adjust the AT Head Zenith
Refer to section 6-1-1.

11. Adjust the Tape Running
Refer to section 6-1-2.

12. Adjust the AT Head Height
Refer to section 6-1-6.

13. Adjust the AT Head Azimuth
Refer to section 6-1-7.

14. Adjust the AT Head Head-to-tape Contact
Refer to section 6-1-8.

15. Adjust the AT Head Position
Refer to section 6-1-9.

16. Confirm the Audio Level in REV Mode
Refer to section 6-1-10.

17. Confirm the Video Tracking
Refer to section 6-1-3.

18. Confirm the Tape Running
Refer to section 6-1-2.

19. Adjust the RF Switching Position
Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 6] : RF SW AUTO)

20. Confirm the SAT Operation
Refer to section 4-3-3 in maintenance manual part 1.
([F 7] : FUNC MODE)

21. Perform the Electrical Adjustment after AT Head Replacement
Refer to section 6-2.

5-11. Pinch Roller Replacement

Replace the pinch roller every 1,000 hours of the tape running.

Outline

Replacement

1. Remove the Pinch Arm Assembly
2. Install the Pinch Arm Assembly
3. Adjust the Pinch Arm Assembly Vertical Play
4. Cleaning (Pinch Roller Surface)

Adjustment after Replacement

5. Confirm the Tape Running (Refer to Section 6-1-2.)
6. Confirm the AT Head Height (Refer to Section 6-1-6.)
7. Confirm the AT Head Azimuth (Refer to Section 6-1-7.)

Notes

- When the pinch roller is damaged or worn, replace the pinch arm assembly.
- When replacing the pinch arm assembly, prepare a new stop washer.
  Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Thickness gauge : 9-911-053-00
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Pinch Arm Assembly

(1) Remove the stop washer at the top of the pinch arm.

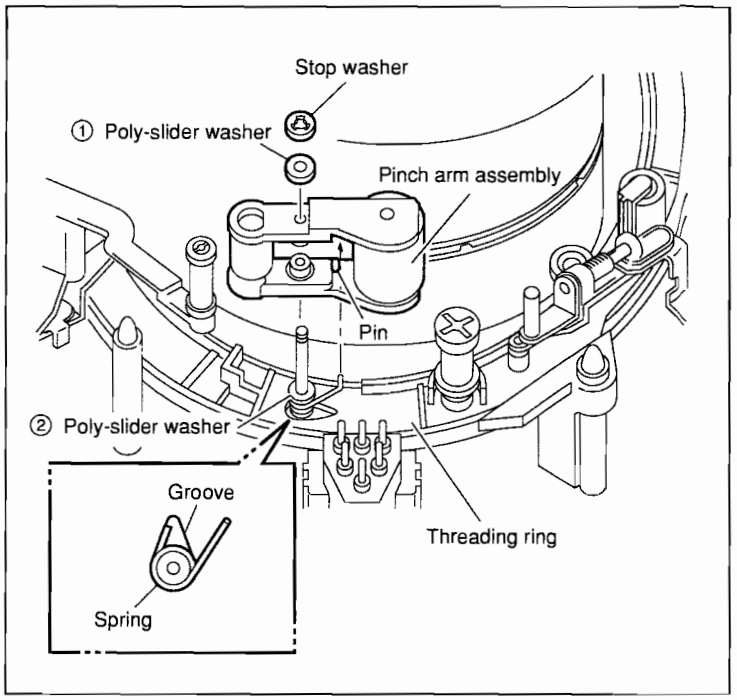
Note

If a poly-slider washer ① is inserted between the pinch arm assembly and the stop washer, be carefull not to lose the poly-slider washer. This poly-slider washer is used for vertical play adjustment.

(2) Remove the pinch arm assembly from the threading ring.

Note

Do not remove the poly-slider washer ② and spring at the bottom of the pinch arm assembly from the shaft.



Pinch Arm Assembly Removal/ Installation

Installation

2. Install the Pinch Arm Assembly

(1) Pass a new pinch arm assembly through the shaft while hooking the spring as shown in the figure.

Notes

- Insert the short-end spring into the groove of the threading ring and hook the long-end spring to the pinch arm assembly.
- If the poly-slider washer ① was removed in step 1, pass the same poly-slider washer through the shaft again.

(2) Fasten the pinch arm assembly by new stop washer.
Stop washer (2.3) : 3-669-596-00

(3) Push the pinch arm assembly manually toward the drum, and confirm that the pinch arm assembly smoothly returns to its original position.

3. Adjust the Pinch Arm Assembly Vertical Play

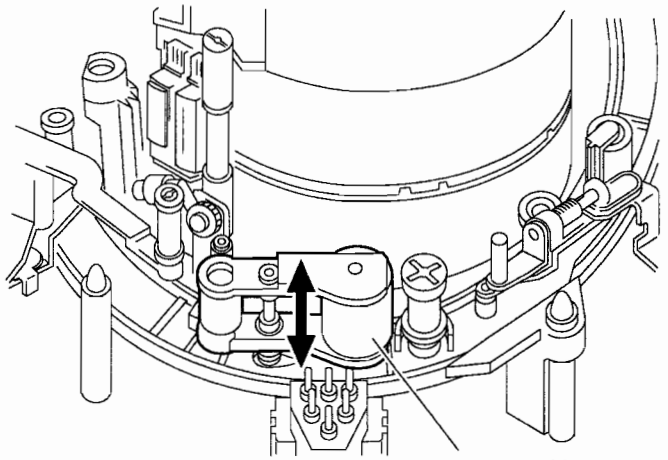
Move the pinch arm assembly in the vertical direction and confirm that the vertical play meets the specification.

If the specification is not met, perform the following adjustment :

(1) Remove the stop washer.
(2) Add or remove the poly-slider washer at the upper of the pinch arm.
(3) Tighten the pinch arm assembly by new stop washer, and confirm again that the specification is met.

4. Cleaning

Clean the pinch roller's cylindrical surface with a cleaning cloth moistened with cleaning fluid. (Refer to section 5-2-7 in maintenance manual part 1.)



Spec. : Vertical play
0.05 mm to 0.2 mm

* When the specification is not satisfied.

• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11

Pinch Arm Assembly Vertical Play Adjsutment

Adjustment after Replacement

5. Confirm the Tape Running

Refer to section 6-1-2.

6. Confirm the AT Head Height

Refer to section 6-1-6.

7. Confirm the AT Head Azimuth

Refer to section 6-1-7.

5-12. Pinch Solenoid Replacement

Replace the pinch solenoid earlier time either 6,000 hours of tape running or 200,000 times of the threading.

Outline

Replacement

1. Disconnect the Harness (CN854/PD-35 Board)
2. Remove the Pinch Press Assembly
3. Remove the PD-35 Board
4. Remove the Pinch Stopper
5. Remove the Pinch Solenoid
6. Install the Pinch Solenoid
7. Install the Pinch Stopper
8. Install the PD-35 Board
9. Install the Pinch Press Assembly
10. Connect the Harness (CN854/PD-35 Board)

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation
    (Refer to section 4-3-2. 2 in maintenance manual part 1.)
    ([F 3] : PINCH ROLLER)
12. Adjust the Pinch Press Clearance (Refer to section 5-12-1.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

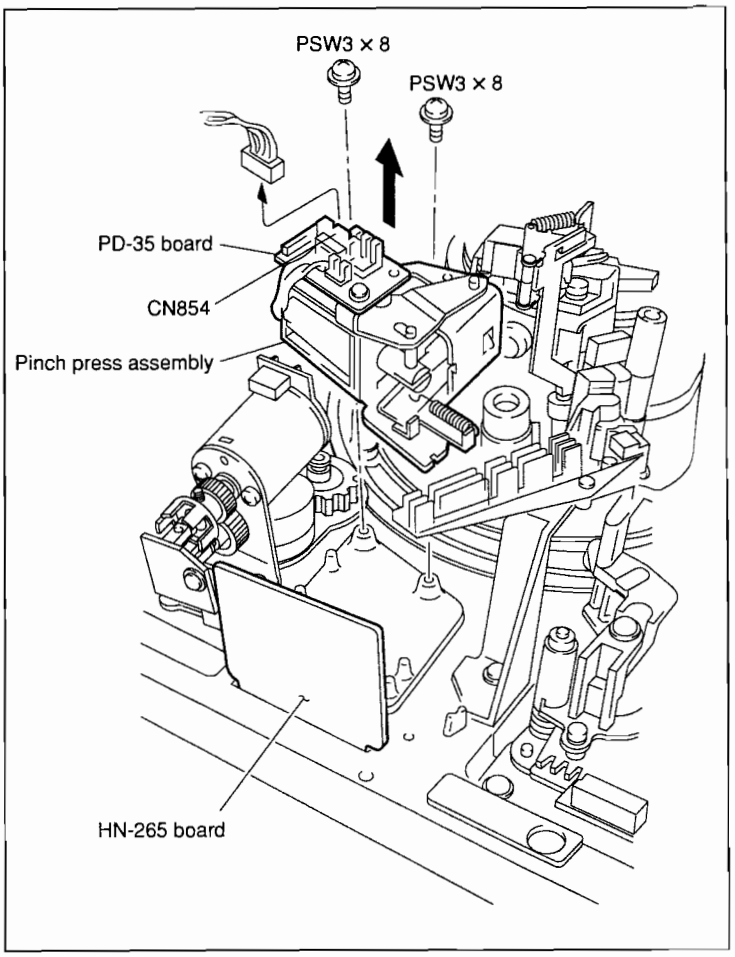
Removal

1. Disconnect the Harness

Disconnect a harness from the connector CN854 on the PD-35 board.

2. Remove the Pinch Press Assembly

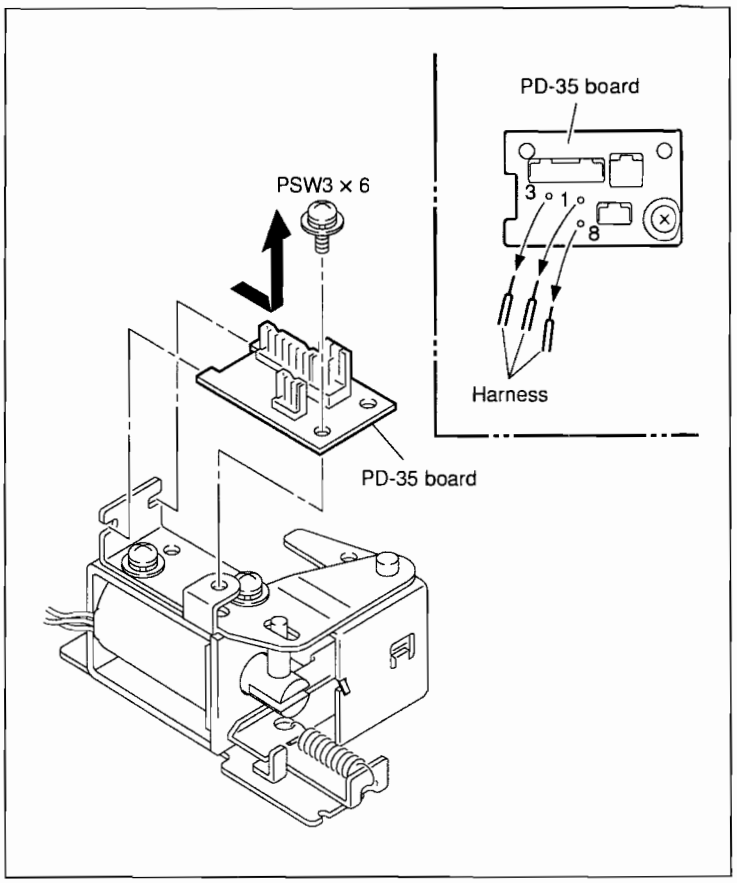
Remove the two screws, then remove the pinch press assembly from the unit.



Pinch Press Assembly Removal

3. Remove the PD-35 Board

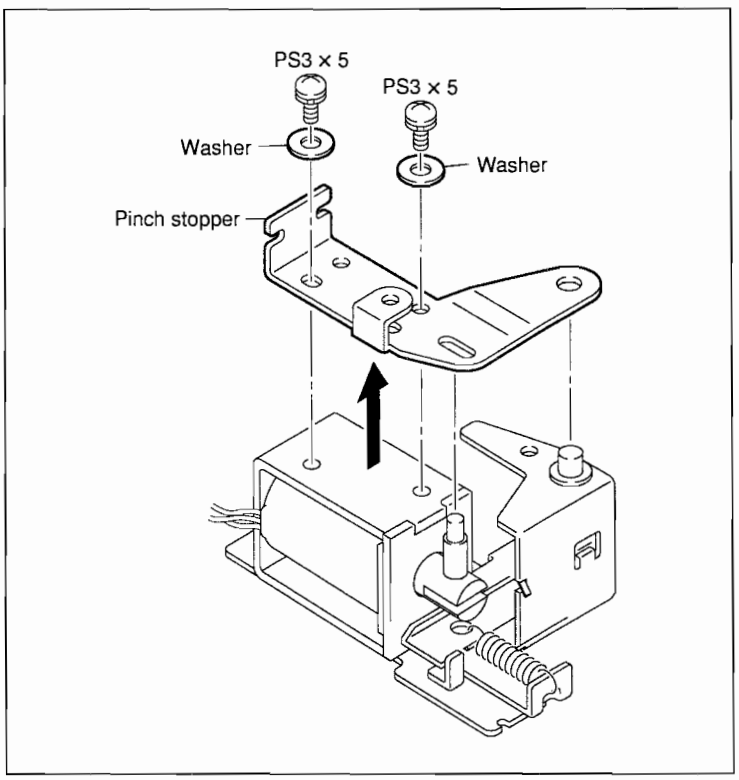
(1) Remove the screw, then remove the PD-35 board from the pinch press assembly.
(2) Unsolder the three harness soldered on the PD-35 board.



PD-35 Board Removal

4. Remove the Pinch Stopper

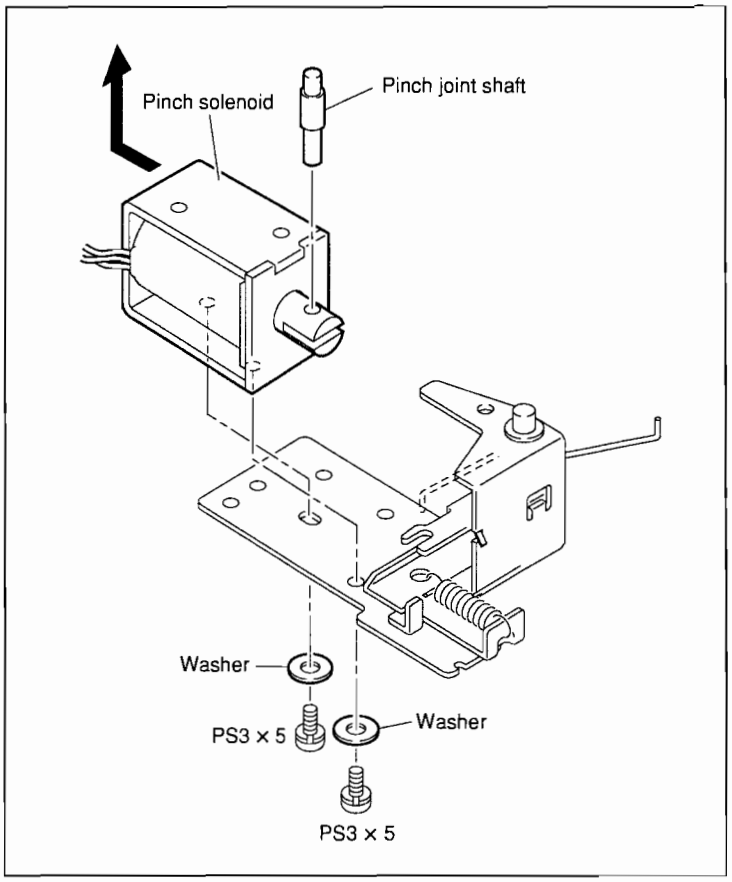
Remove the two screws and washers, then remove the pinch stopper.



Pinch Stopper Removal

5. Remove the Pinch Solenoid

(1) Extract the pinch joint shaft.
(2) Remove the two screws and washers, then remove the pinch solenoid.



Pinch Solenoid Removal

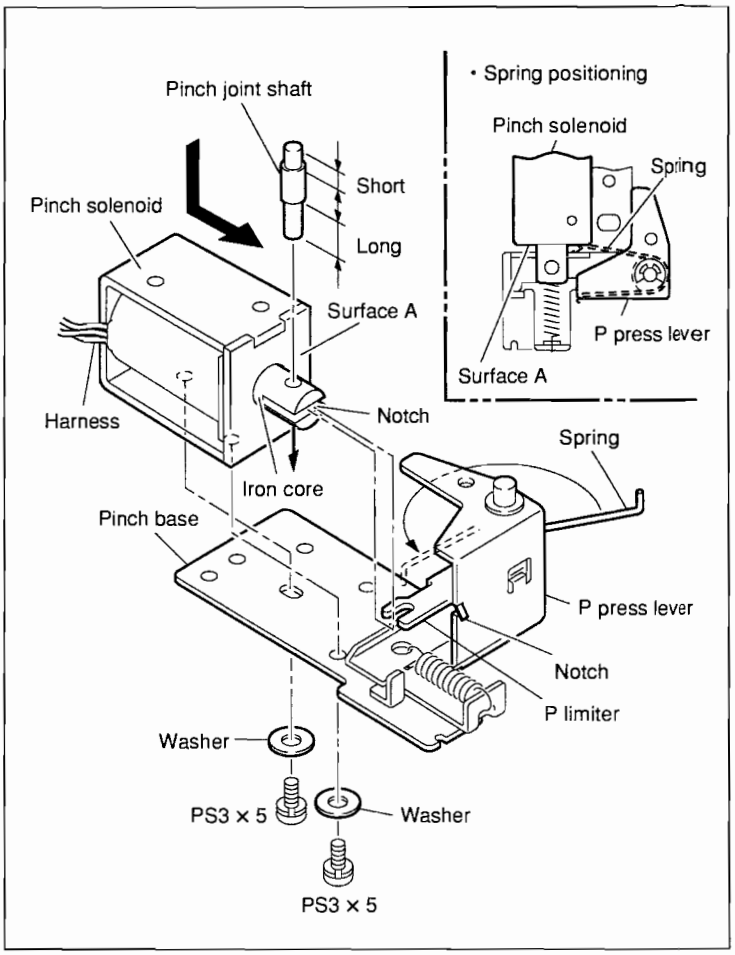
Installation

6. Install the Pinch Solenoid

(1) Install a new solenoid to the pinch base in the direction shown in the figure.
(2) Bend the spring in the direction indicated by the arrow and bring it into contact with surface A of the solenoid shown in the figure.
(3) Put the P limiter into the notch of the solenoid's iron core and pass the pinch joint shaft through the hole of the iron core in the direction shown in the figure.
(4) Put the two washers and tighten the two screws.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

(5) Confirm that the other end of the spring is put on the notch of the P press lever.



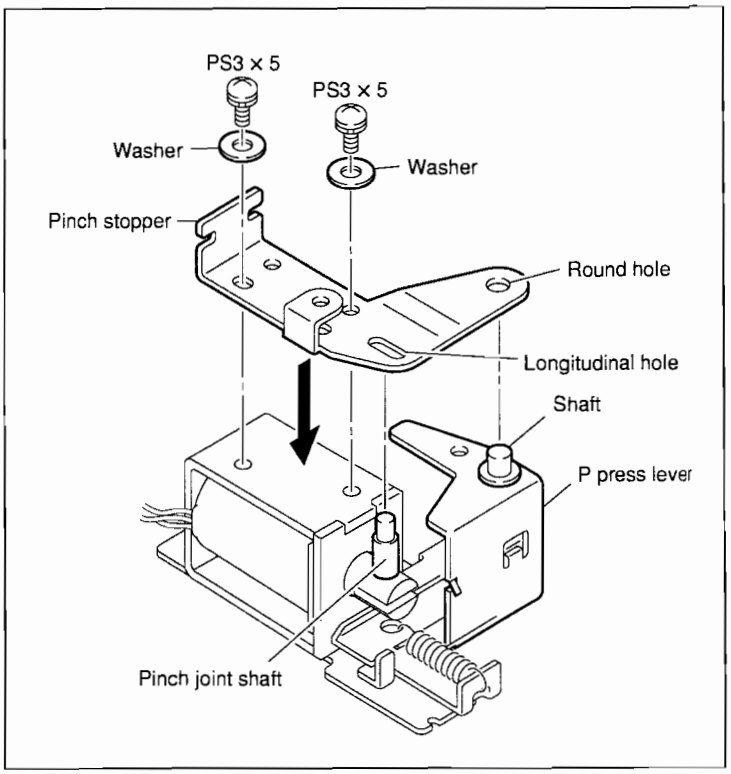
Pinch Solenoid Installation

7. Install the Pinch Stopper

(1) Pass the longitudinal hole of the pinch stopper to the pinch joint shaft, then pass the round hole to the shaft of the P press lever.

(2) Put the washers and tighten the screws.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

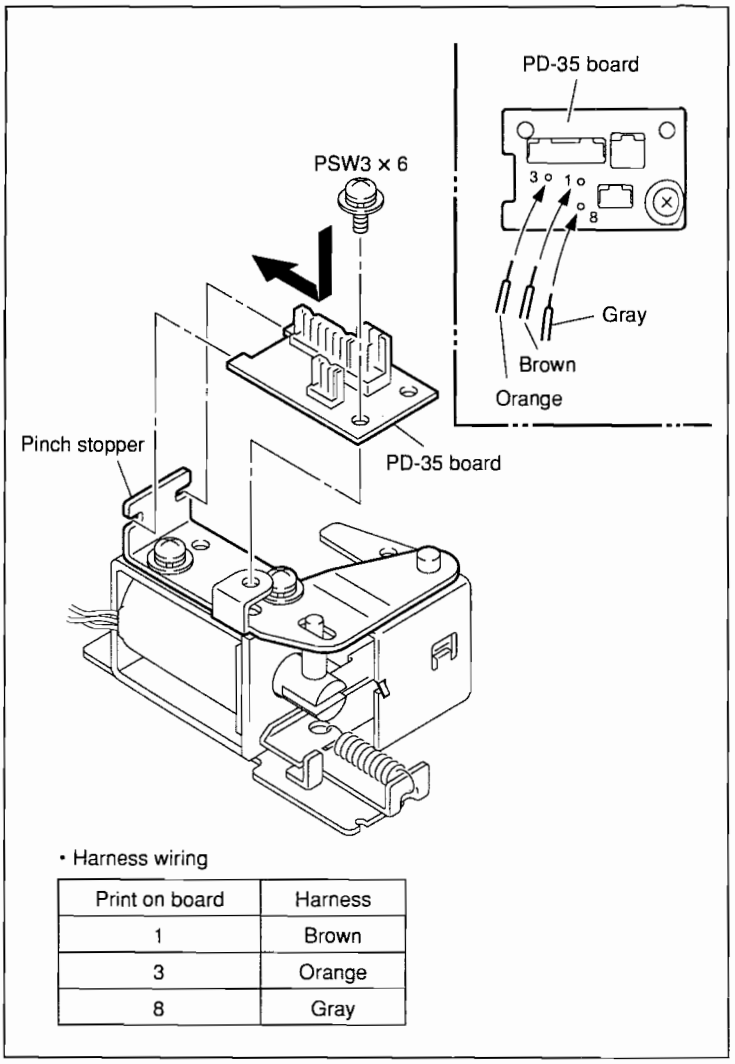


Pinch Stopper Installation

8. Install the PD-35 Board

(1) Wire the harness to the PD-35 board as shown in the figure, then solder.

(2) Insert the PD-35 board into the pinch stopper and tighten the screw.



• Harness wiring

Print on board	Harness
1	Brown
3	Orange
8	Gray

PD-35 Board Installation

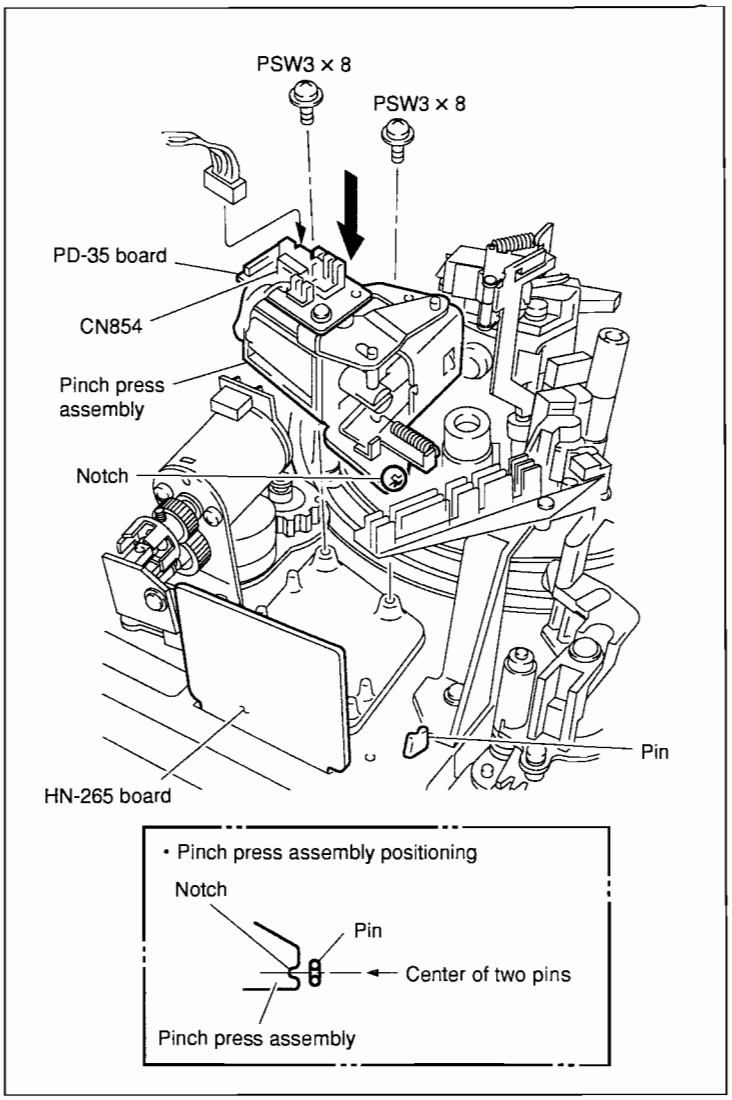
9. Install the Pinch Press Assembly

Align the notch of the pinch press assembly with the center of the two pins and tighten the two screws.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

10. Connect the Harness

Connect the harness into connector CN854 on the PD-35 board.



Pinch Press Assembly Installation

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation

Refer to section 4-3-2. 2 in maintenance manual part 1.
([F 3] : PINCH ROLLER)

12. Adjust the Pinch Press Clearance

Refer to section 5-12-1.

5-12-1. Pinch Press Clearance Adjustment

Note

Be sure to check the clearance of the P press lever in energized state when the pinch press assembly is removed.

Tool

• Wire clearance check gauge set : J-6152-450-A

Check

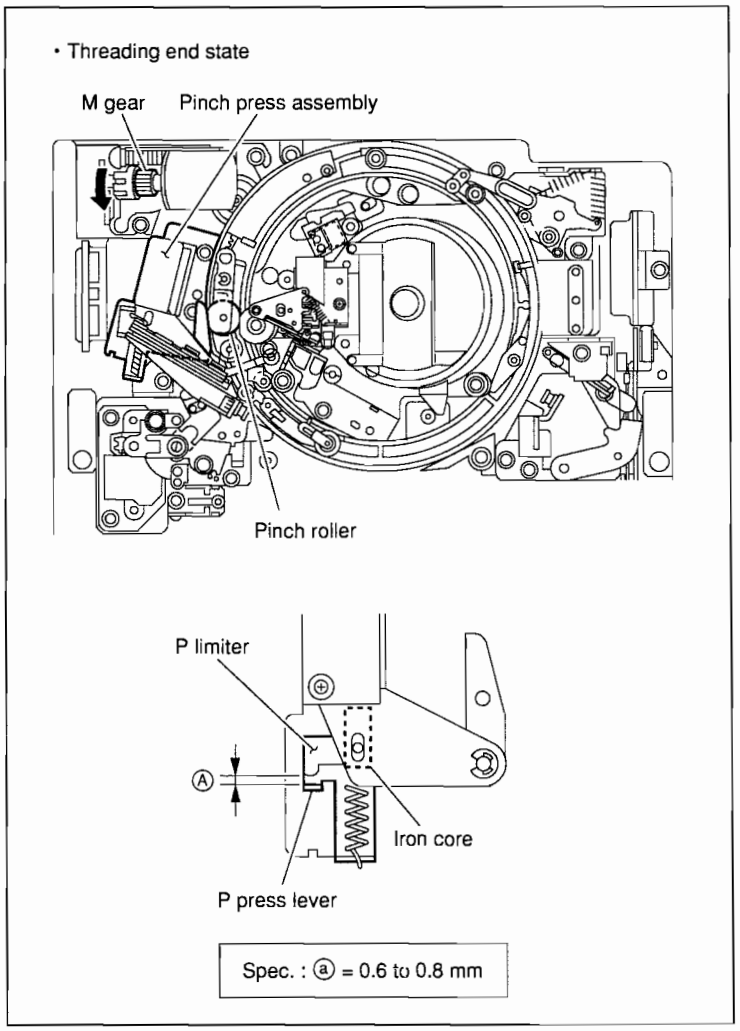
1. Put the Pinch Solenoid in the Energized State

(1) Turn the M gear of the gear box assembly manually, and put the unit in the threading end mode.
(2) Press the iron core of the pinch solenoid toward plunging direction.

2. Check the Pinch Press Clearance

Check that the clearance between the P limiter and P press lever meets the specification.

If the specification is not met, perform steps 3 and later.



Pinch Press Clearance Check

Adjustment

3. Loosen Screws

Loosen the two screws securing the pinch press assembly by 1/2 to one turn.

4. Adjust the Pinch Press Assembly Position

Put the pinch solenoid in the energized state, then insert the tip of a 3 mm flat-blade screwdriver into the notch of the pinch press assembly. Adjust the pinch press assembly position so that the specification is met.

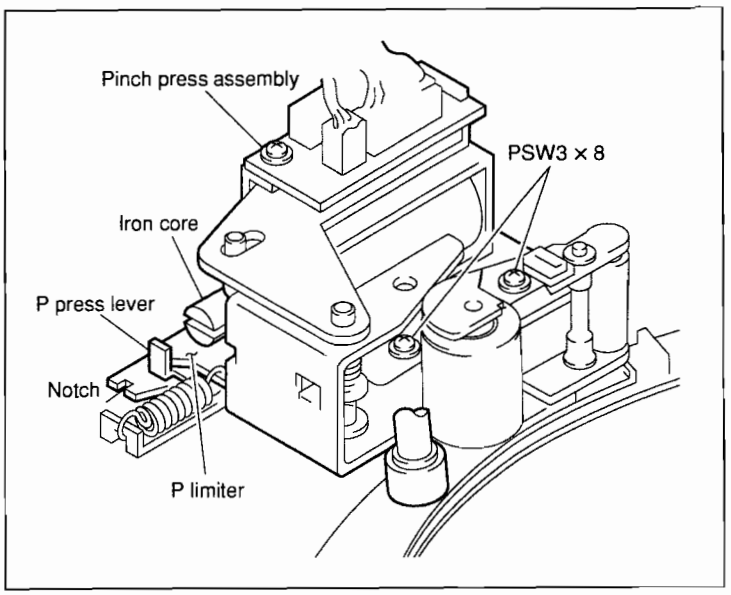
5. Tighten Screws

Tighten the two screws loosened in step 3.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

6. Recheck the Pinch Press Clearance

Refer to steps 1 and 2.



Pinch Press Clearance Adjustment

5-13. Capstan Motor Replacement

Replace the capstan motor every 3,000 hours of tape running.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Open the DR-307 board
3. Remove the Capstan Motor
4. Install the Capstan Motor
5. Close the DR-307 Board
6. Install the Video Head Cleaner Assembly
7. Cleaning (Capstan Motor Shaft)

Adjustment after Replacement

8. Confirm the Pinch Press Clearance (Refer to section 5-12-1.)
9. Confirm the Tape Running (Refer to section 6-1-2.)
10. Perform the Capstan Motor Operation (Refer to section 4-3-2. 1 in maintenance manual part 1.) ([F 9] : CAPSTAN MOTOR)
11. Adjust the Capstan FG Duty (Refer to section 4-4-1. 1 in maintenance manual part 1.) ([F 5] : CAPSTAN FG DUTY ADJUST)
12. Adjust the Capstan Free Speed (Refer to section 4-4-1. 2 in maintenance manual part 1.) ([F 4] : CAPSTAN FREE SPEED ADJUST)
13. Save the Adjusted Data (Refer to section 4-4-1. 2 in maintenance manual part 1.) ([F 1] : NVRAM CONTROL)
14. Adjust the Capstan FG Level (Refer to section 4-4-2 in maintenance manual part 1.) ([F 3] : CAPSTAN FG LEVEL)
15. Save the Adjusted Data (Refer to section 4-4-2 in maintenance manual part 1.) ([F 1] : NVRAM CONTROL)

Preparation

1. Turn the power off.
2. Remove the upper lid
   (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

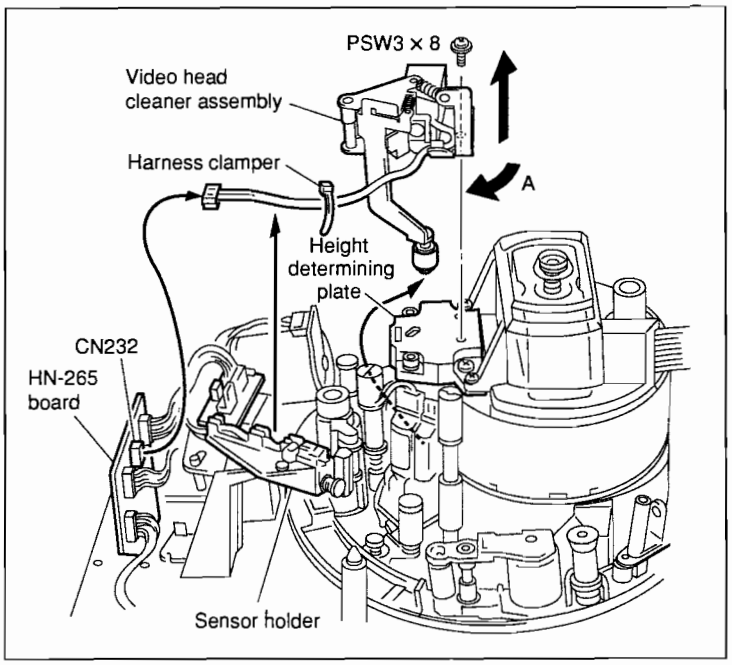
Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect a connector from connector CN232 on the HN-265 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the arrow A direction, and remove it from the height determining plate.

Note

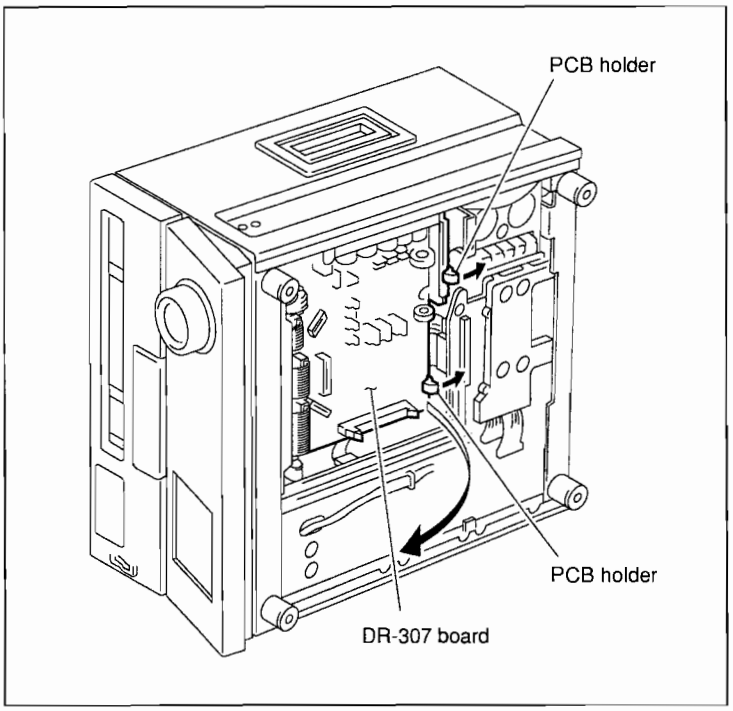
To remove the fixing screws of the capstan motor, remove the video head cleaner assembly.



Video Head Cleaner Assembly Removal

2. Open the DR-307 Board

Put the left side panel of the unit to down. Remove the bottom plate, then open the DR-307 board.



Opening the DR-307 Board

3. Remove the Capstan Motor

(1) Disconnect the connector on the capstan motor board.

(2) Remove the two screws while holding the capstan motor by hand.

CAUTION

Be careful not to drop the capstan motor.

Installation

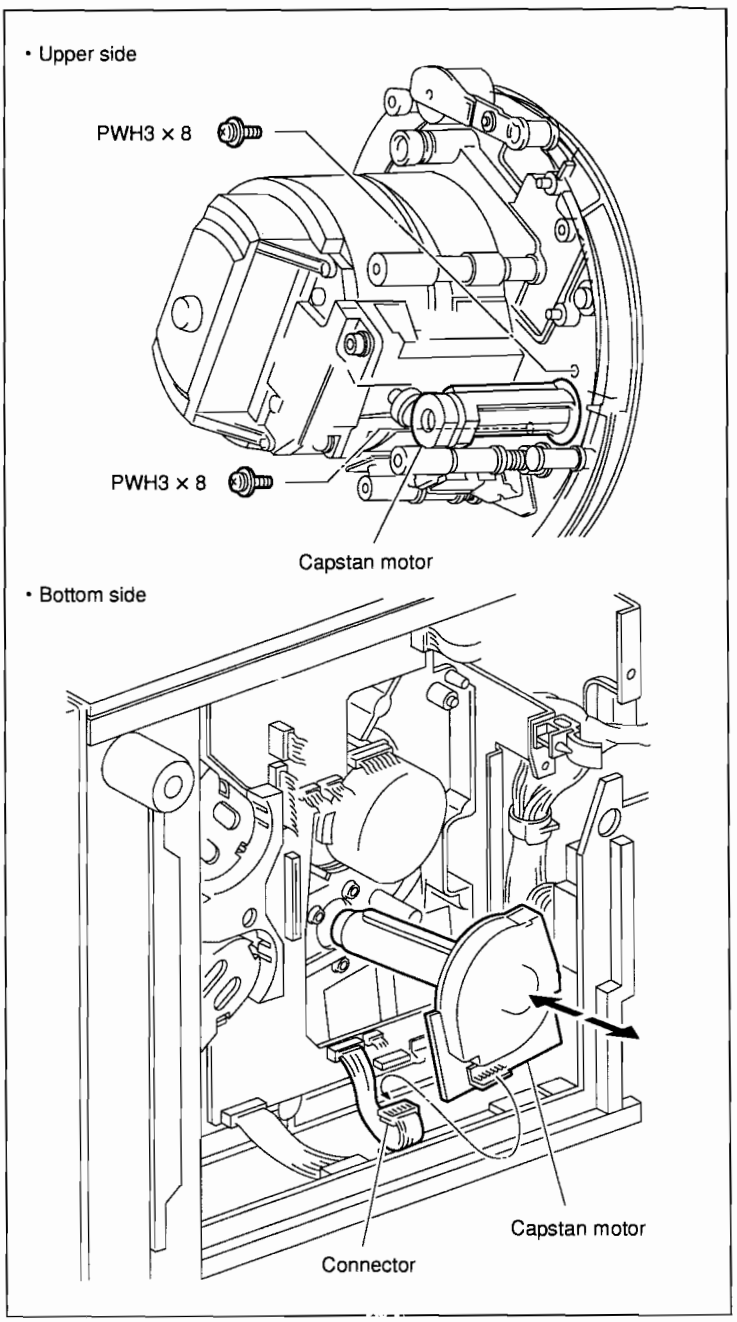
4. Install the Capstan Motor

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten the two screws.

CAUTION

Be careful not to damage the capstan motor shaft when passing the capstan motor through the hole of the chassis.

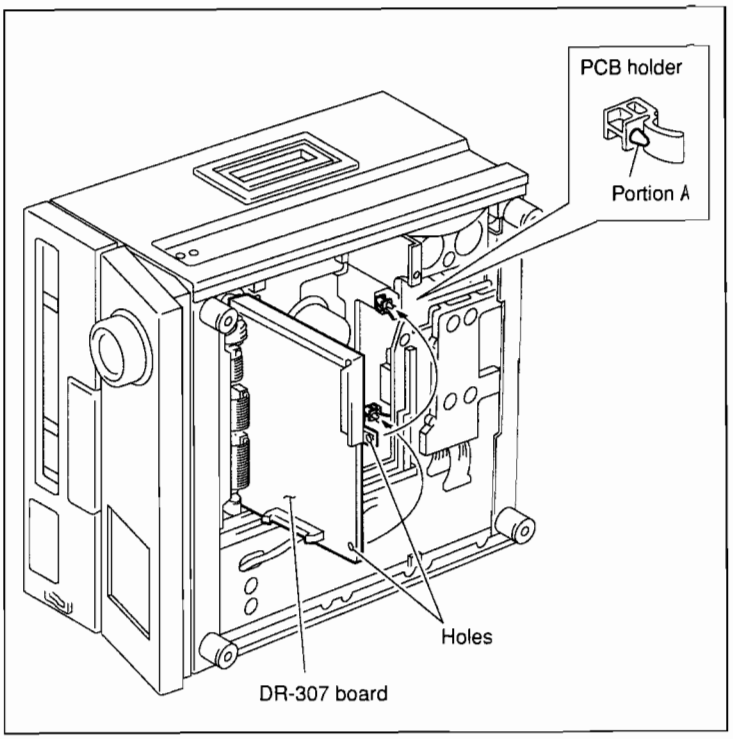
(2) Connect the connector disconnected in (1) of step 3 to the capstan motor board.



Capstan Motor Removal/Installation

5. Close the DR-307 Board

Put the two holes on the DR-307 board into the two portions A of the PCB holder shown in the figure.



Closing the DR-307 Board

6. Install the Video Head Cleaner Assembly

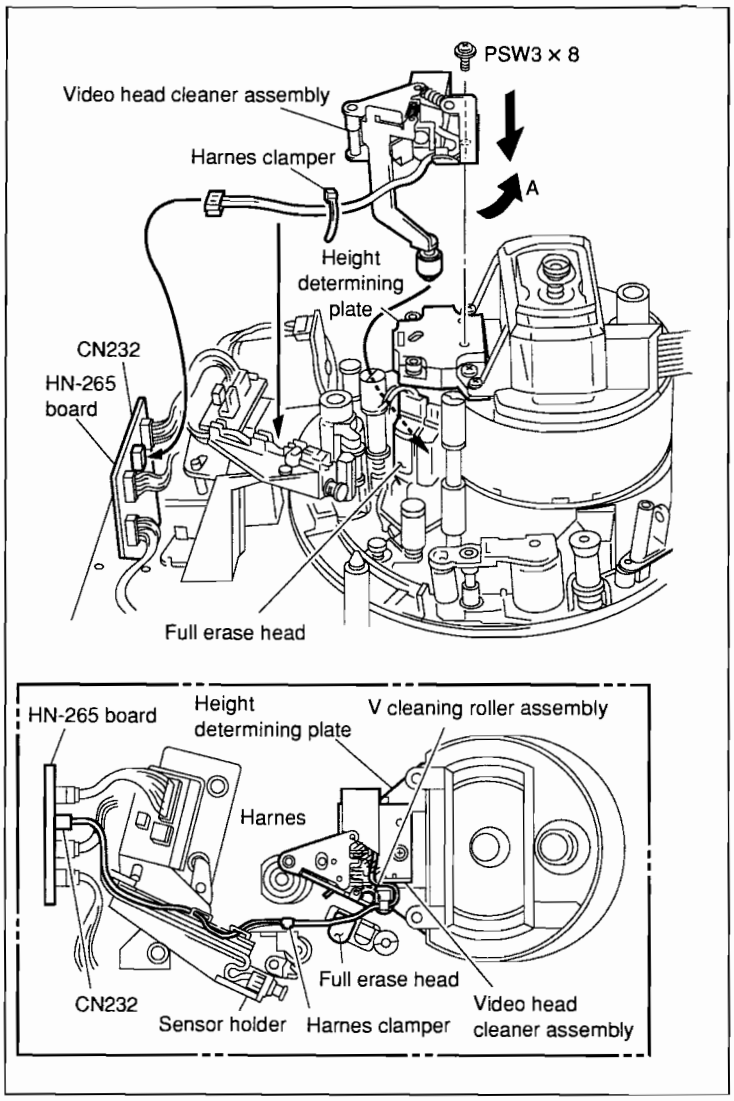
(1) Insert the V cleaning roller assembly between the height determining plate and full erase head as shown in the figure.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determining plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the arrow A direction.
(4) Fix the harness to the sensor holder position shown in the figure.
(5) Connect a connector to CN232 on the HN-265 board.
(6) Bind the CTL/full erase head harness and the video head cleaner assembly harness with the harness clamper or the equivalent clamper.

7. Cleaning

Clean the capstan motor shaft with cleaning cloth moistened with cleaning fluid.

Note

Be sure to wipe the capstan motor shaft with dry cloth after the cleaning.



Video Head Cleaner Assembly Installation

Adjustment after Replacement

8. Confirm the Pinch Press Clearance

Refer to section 5-12-1.

9. Confirm the Tape Running

Refer to section 6-1-2.

10. Perform the Capstan Motor Operation

Refer to section 4-3-2. 1 in maintenance manual part 1.
([F 9] : CAPSTAN MOTOR)

11. Adjust the Capstan FG Duty

Refer to section 4-4-1. 1 in maintenance manual part 1.
([F 5] : CAPSTAN FG DUTY ADJUST)

12. Adjust the Capstan Free Speed

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 4] : CAPSTAN FREE SPEED ADJUST)

13. Save the Adjusted Data

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 1] : NVRAM CONTROL)

14. Adjust the Capstan FG Level

Refer to section 4-4-2 in maintenance manual part 1.
([F 3] : CAPSTAN FG LEVEL)

15. Save the Adjusted Data

Refer to section 4-4-2 in maintenance manual part 1.
([F 1] : NVRAM CONTROL)

5-14. Reel Table Assembly Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Install the Reel Table Assembly

Adjustment after replacement

3. Confirm the Reel Table Height (Refer to section 5-14-1.)
4. Confirm the Reel Brake Clearance (Refer to section 5-14-2.)
5. Confirm the Reel Brake Release Amount (Refer to section 5-14-3.)
6. Confirm the Reel Table Rotation Sensor Position (Refer to section 5-14-4.)
7. Adjust the Reel FG Duty (Refer to section 4-4-1. 1 in maintenance manual part 1.)
   ([F 3] : S REEL FG DUTY ADJUST/[F 4] : T REEL FG DUTY ADJUST)

Note

The reel table assembly replacement is the same on the supply (S) and take-up (T) sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L wrench (D = 1.5 mm) : 7-700-736-05
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

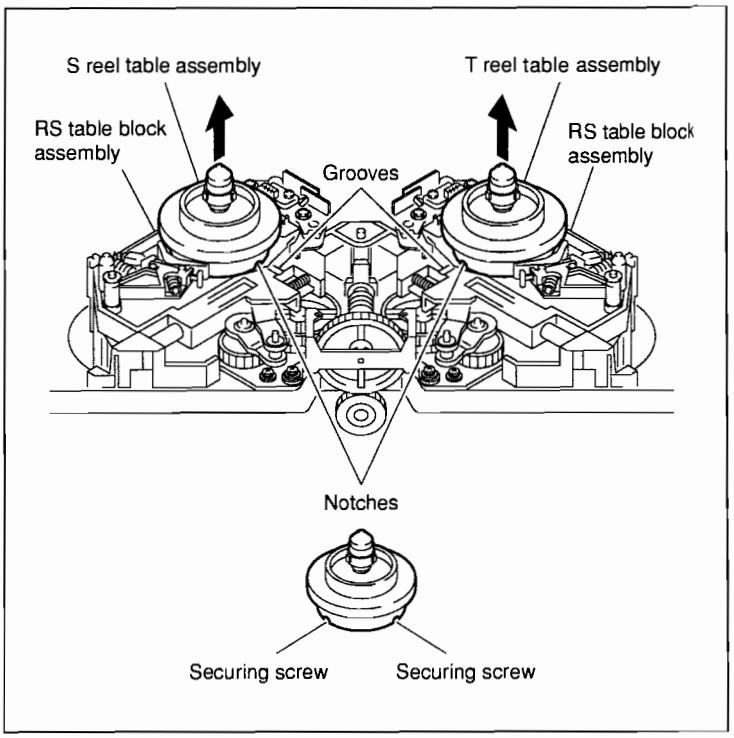
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

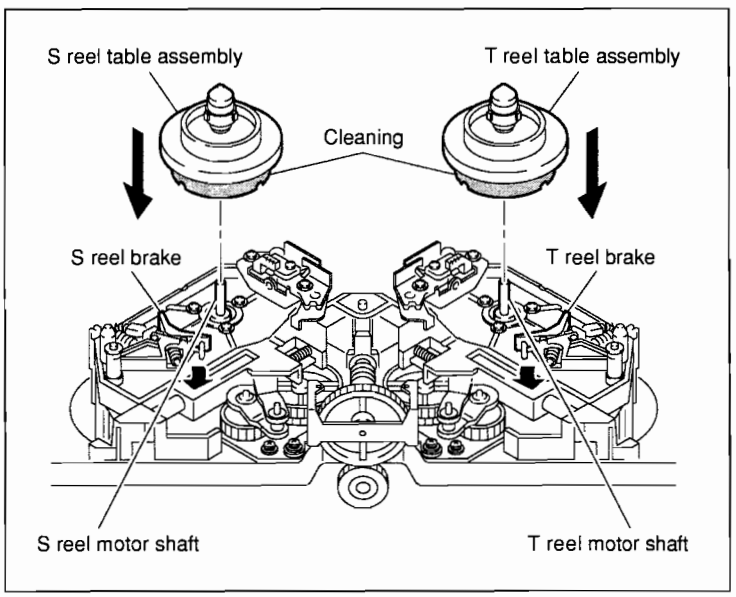
Installation

2. Install the Reel Table Assembly

(1) Clean the circumference of a new reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Reel Table Assembly Installation

Adjustment after Replacement

3. Confirm the Reel Table Height

Refer to section 5-14-1.

4. Confirm the Reel Brake Clearance

Refer to section 5-14-2.

5. Confirm the Reel Brake Release Amount

Refer to section 5-14-3.

6. Confirm the Reel Table Rotation Sensor Position

Refer to section 5-14-4.

7. Adjust the Reel FG Duty

Refer to section 4-4-1. 1 in mintenance manual part 1. (F 3 : S REEL FG DUTY ADJUST/F 4 : T REEL FG DUTY ADJUST)

5-14-1. Reel Table Height Adjustment

Notes

- Be sure to check the height of the reel table when a reel table is removed or when it is replaced.
- Perform the reel table height adjustment correctly.
  The height of the reel table is used as the reference for the tape path.
- After the supply reel table height adjustment is performed, be sure to check the video tracking. (Refer to section 6-1-3.)

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel table height gauge (MW-935) : J-6329-350-A
- L-shaped wrench (D = 1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

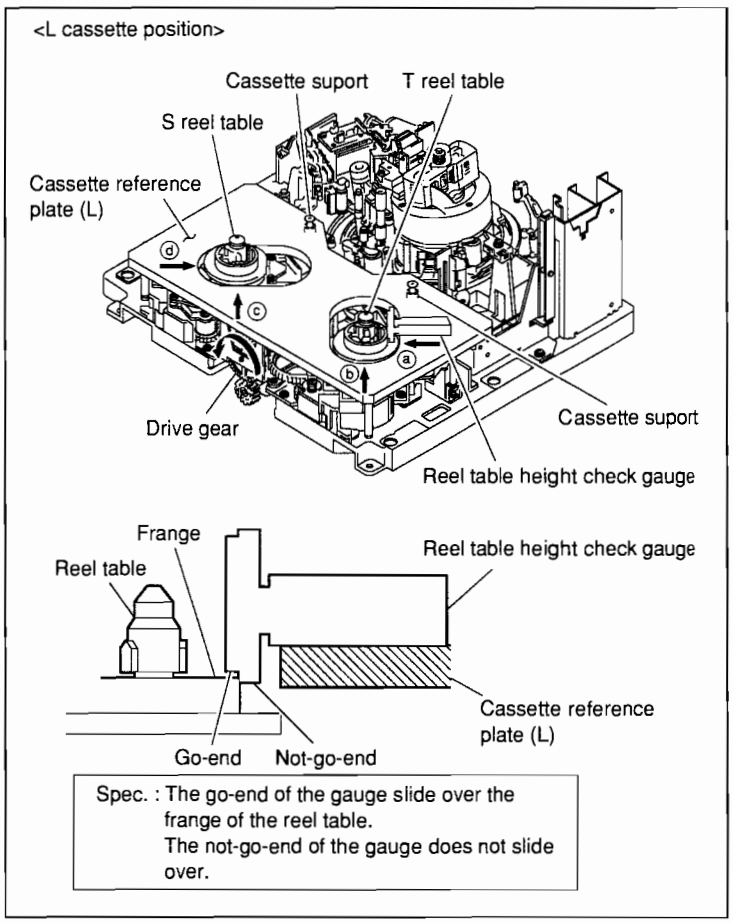
Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the RS Table Block Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Take-up Reel Table Height

(1) Press the "T"-stamped side of the gauge against the take-up reel table from the direction indicated by the arrow ⓐ.
(2) Check that the specification is met while rotating the take-up reel table clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓑ in the same way.



Reel Table Height (L) Confirmation

4. Check the Supply Reel Table Height

(1) Press the "S"-stamped side of the gauge against the supply reel table from the direction indicated by the arrow ⓒ.
(2) Check that the specification is met while rotating the supply reel table counter-clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓓ in the same way.

If the specification is not met in steps 3 and 4, perform steps 7 and 8.

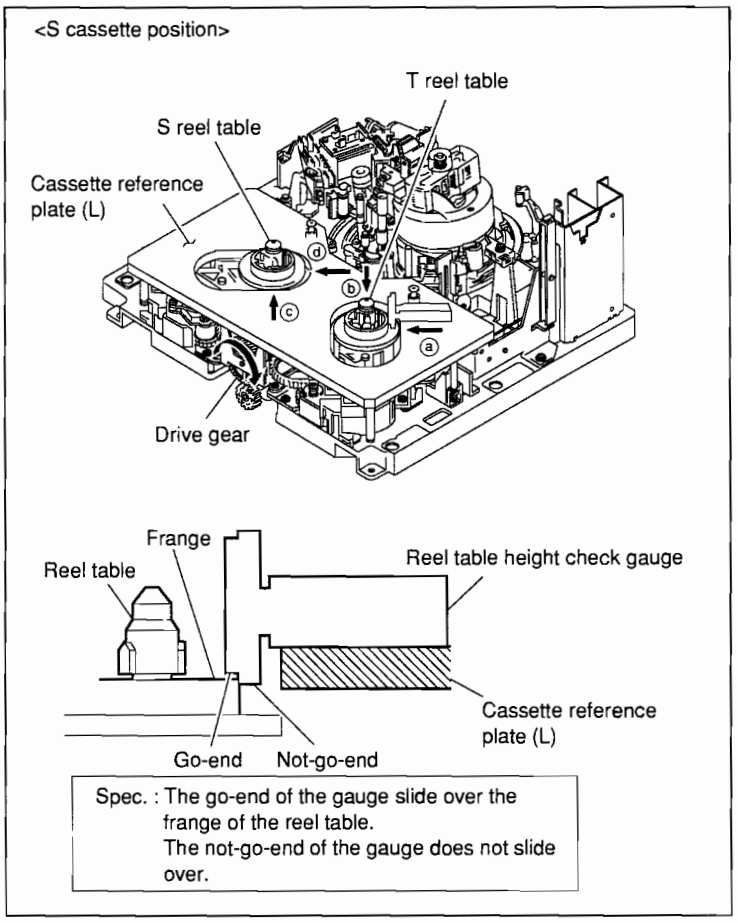
5. Place the RS Table Block Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

6. Check the Supply and Take-up Reel Table Height

Perform in the same way as in steps 3 and 4.

If the specification is not met, perform steps 7 and later.
If the specifications are met in both the L and S cassette positions, perform steps 9 and later.


<S cassette position>
T reel table
S reel table
Cassette reference plate (L)
Drive gear
Frange
Reel table
Reel table height check gauge
Cassette reference plate (L)
Go-end
Not-go-end
Spec. : The go-end of the gauge slide over the frange of the reel table.
The not-go-end of the gauge does not slide over.

Reel Table Height (S) Confirmation

Adjustment

7. Remove the Reel Table

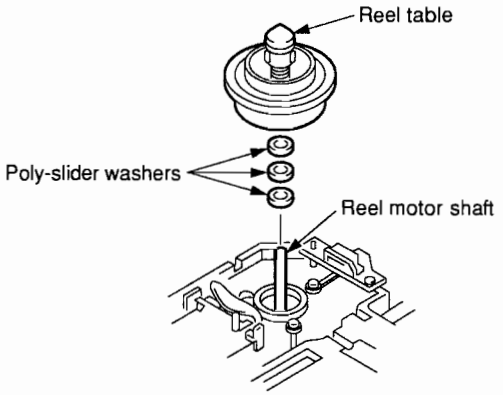
Refer to step 1 in section 5-14.

8. Adjust the Number of Poly-slider Washers

Adjust the number of poly-slider washers installed in the reel motor shaft so that the specifications are met in both the L and S cassette positions.

9. Remove the Cassette Reference Plate (L)

Remove the cassette reference plate (L) and reel table height gauge.



• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
4 mm	0.05 mm	3-188-108-01
	0.13 mm	3-701-441-01
	0.25 mm	3-701-441-11
	0.5 mm	3-701-441-21

Reel Table Adjustment

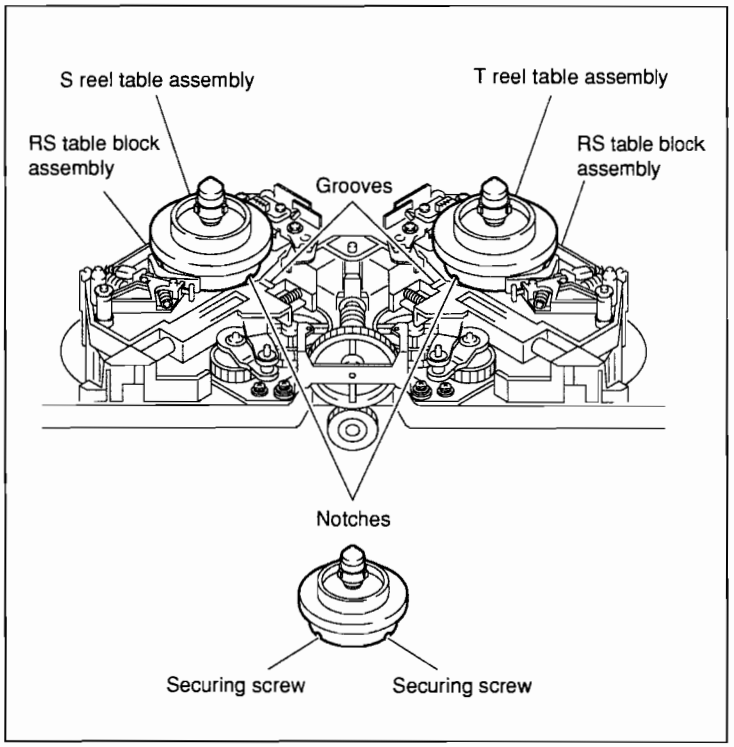
10. Install the Reel Table Assembly

(1) Align the notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.

(2) Insert an L-shaped wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly and tighten the two screws.

11. Recheck the Reel Table Height

Refer to steps 1 through 6.



Reel Table Assembly Removal/Installation

5-14-2. Reel Brake Clearance Check

Note

Be sure to check clearance of the reel brake when the reel table assembly is removed or when it is replaced.

Check

1. Check the Take-up Reel Brake Clearance

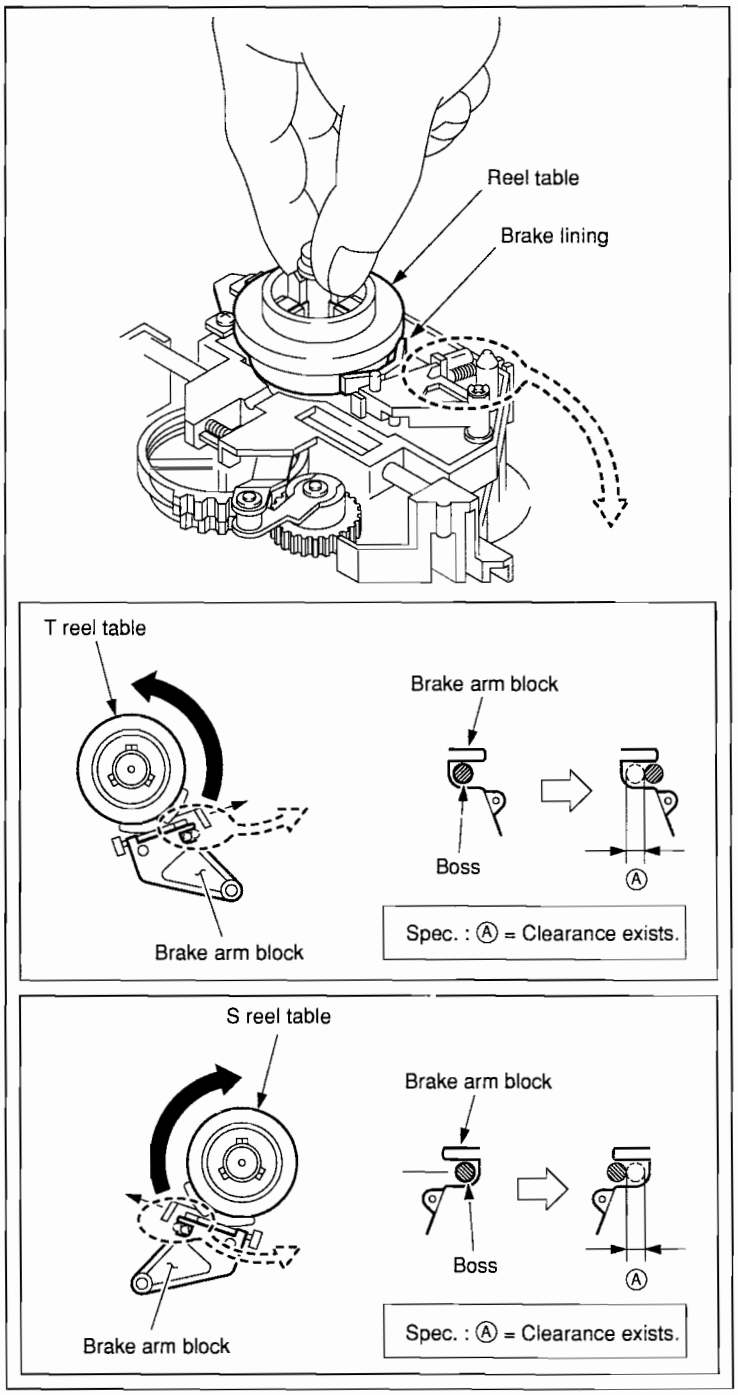
Rotate the take-up reel table counterclockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.

2. Check the Supply Reel Brake Clearance

Rotate the supply reel table clockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 5-15.



Reel Brake Clearance Confirmation

5-14-3. Reel Brake Release Amount Adjustment

Notes

- Be sure to check the release amount of the reel brake when the reel table assembly is removed or when it is replaced.
- Be sure to check the following when performing adjustment with the specification not met.
  (1) Cassette pillar height check (Refer to section 5-16-2.)
  (2) Reel table height check (Refer to section 5-14-1.)

Basic knowledge

The brake lining is pressed against the reel table when the power is off.
When the power is turned on, the brake lining is released and away from the reel table. In the PLAY, STOP, REW, F. FWD, SEARCH and REV modes, the brake lining remains released.
Press the EJECT button to put the unit into the EJECT mode. The brake lining is pressed against the reel table a few seconds after the EJECT mode is completed.

Tool

- Wire clearance check gauge set : J-6152-450-A

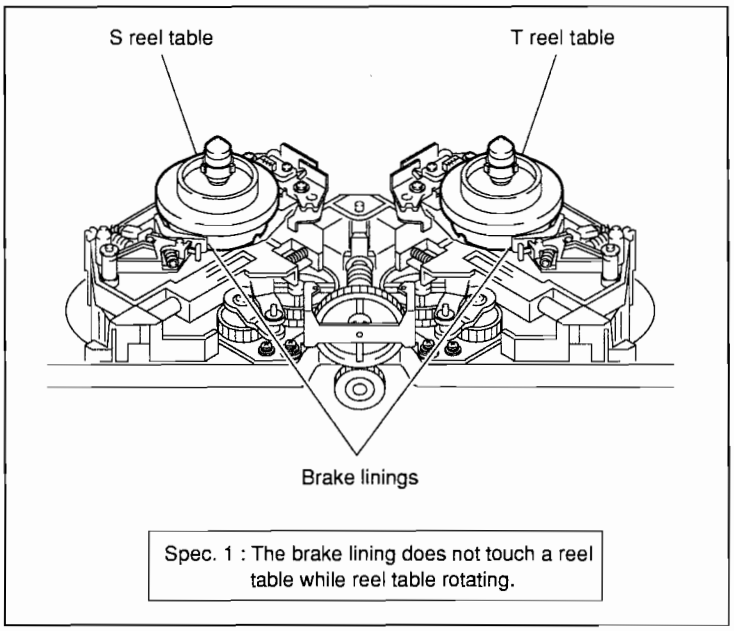
Check

1. Turn the Power On

2. Check the Brake Release Amount

Check on the supply and take-up sides that the brake lining does not touch the reel table while a reel table is rotating. (Specification 1)

If specification 1 is not met, perform steps 3 and later.



Reel Brake Release Amount Confirmation

Adjustment

3. Turn the Power Off

4. Remove the RS Table Block Assembly

Refer to steps 1 through 3 in section 5-16.
(It is not necessary to remove the reel table.)

5. Loosen the Screws Fixing the Brake Solenoid

Loosen the two screws fixing the brake solenoid.

6. Adjust the Brake Solenoid Position

Press down the iron core of the brake solenoid to the energized position. At that time, adjust the brake solenoid position so that the clearance between the brake lining and reel table satisfies specification 2.

Note

Press down only the iron core by a sharp-pointed stick.
Do no touch other portions.

Know-how :

- Shift the brake solenoid upward.
  → Clearance A is narrowed.
- Shift the brake solenoid downward.
  → Clearance A is widened.

7. Tighten the Screws Fixing the Brake Solenoid

Tighten the two screws loosened in step 5.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

8. Recheck the Brake Release Amount

Refer to step 6.

9. Install the RS Table Block Assembly

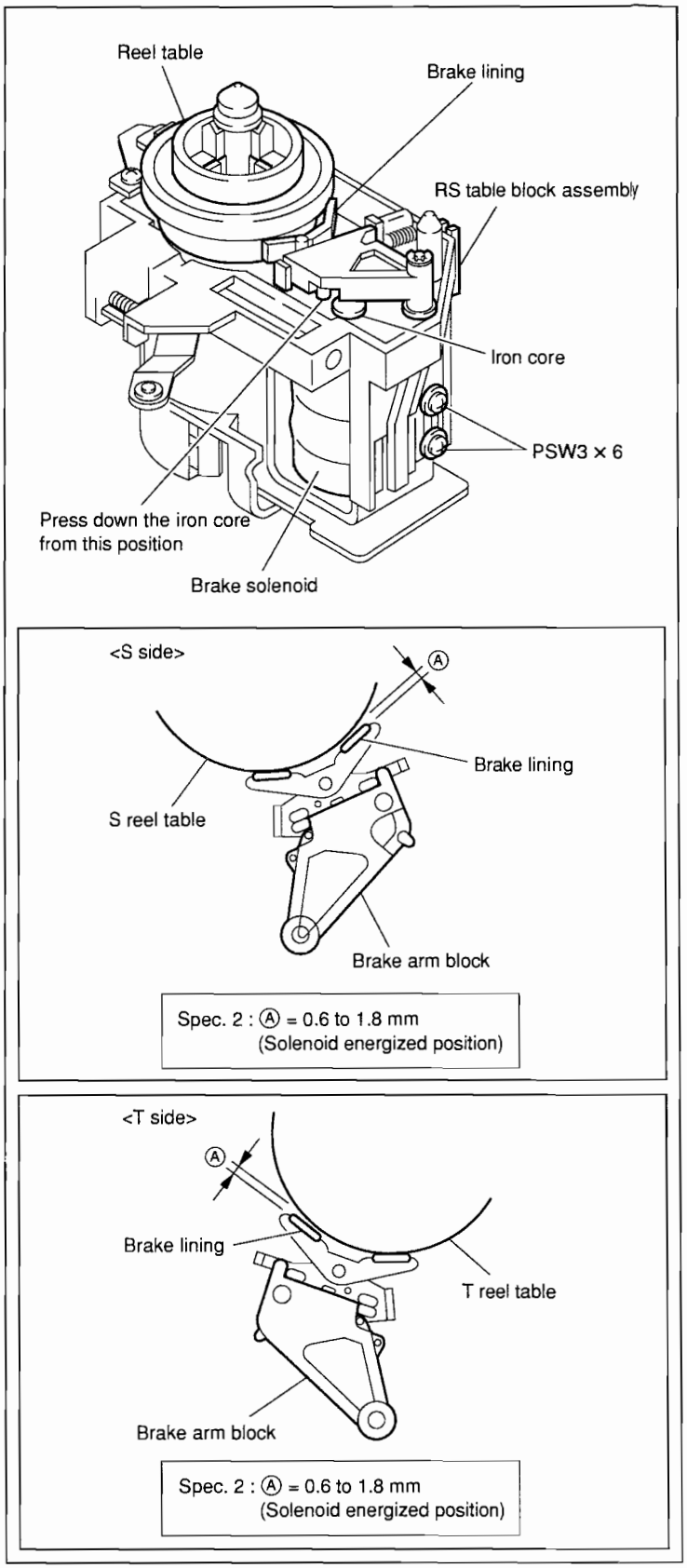
Refer to steps 9 through 19 in section 5-16.
It is not necessary to smear grease again to the slide shaft or to apply oil again to the crank arm (A).

10. Check the Cassette Pillar Height

Refer to section 5-16-2.

11. Check the Reel Table Height

Refer to section 5-14-1.



Reel Brake Release Amount Adjustment

5-14-4. Reel Table Rotation Sensor Position Adjustment

Note

- Be sure to check the position of the reel table rotation sensor when a reel motor assembly or reel table is replaced.

Tools

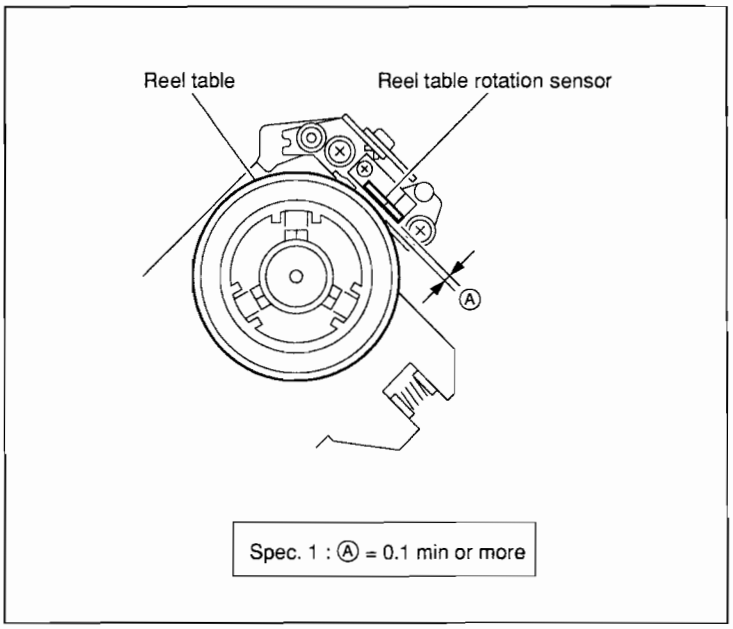
- Thickness gauge : 9-911-053-00
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A

Check

1. Check the Reel Table Rotation Sensor Clearance

Check that the clearance between the reel table and the reel table rotation sensor meet the specification 1.

If the specification 1 is not met, perform steps 4 and later.



Reel Table Rotation Sensor Clearance Confirmation

2. Connect the Oscilloscope

CH-1 : TP241/HN-266 board (S-FG signal)
CH-2 : TP242/HN-266 board (T-FG signal)

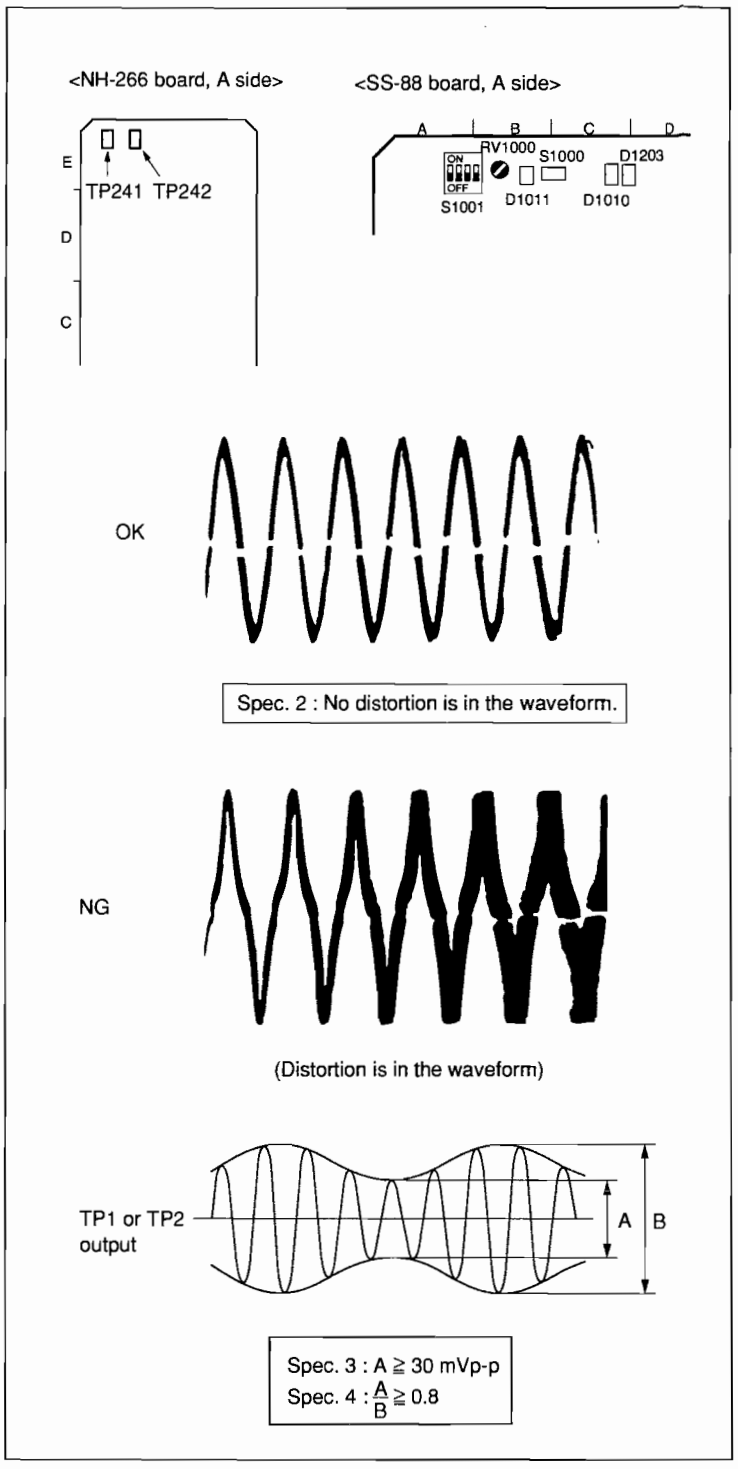
3. Check the Reel FG Output Level

(1) Set bit-4 of switch S1001 on the SS-88 board to ON (upper) position.

CAUTION

Be sure to return the above swith to OFF (lower) position after the confirmation.

(2) Turn the power on.
(3) Put the unit in STOP mode. Confirm the reel FG outputs on oscilloscope whether they meet the specifications 2, 3 and 4 or not. If not, perform step 4 and later.
(4) Set bit-4 of switch S1001 on the SS-88 board to OFF (lower) position.



Reel FG Output Level Confirmation

Adjustment

4. Loosen the Screws

Loosen the two screws by 1/4 to 1/2 turn.

5. Adjust the Reel Table Rotation Sensor Position

(1) Put the unit into the STOP mode in a state of without cassette tape by putting the STOP button.

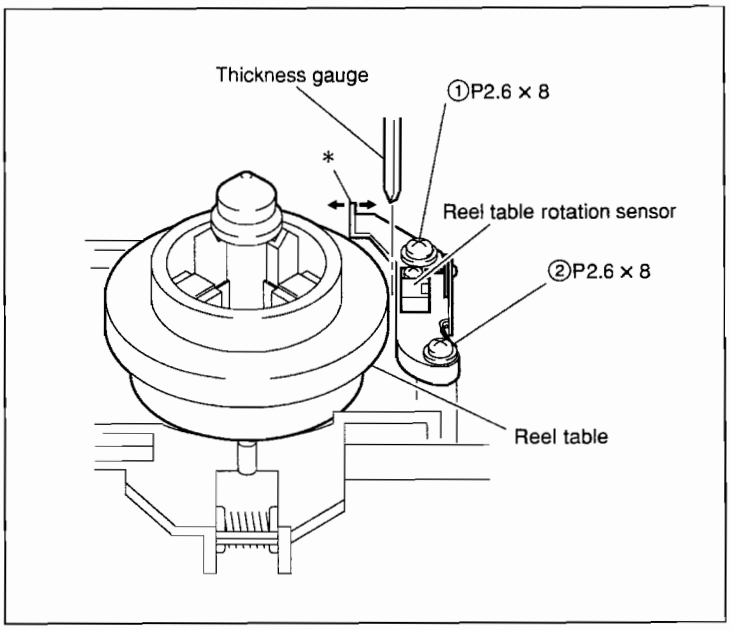
(2) Adjust the position of the reel table rotation sensor so that the distortion is not in the waveform, and maximize.

- Adjustment method

  Grasp the portion "*" with the finger, and adjust the sensor to slightly move in the direction of the left and right.

(3) Tighten the two screws loosen in step 4 in oder of ① and ② while keeping the state of the step (2).

Tightening torque: 49×10^{-2} N•m
(5 kgf • cm)



Reel Table Rotation Sensor Position Adjustment

6. Recheck the Reel Table Rotation Sensor Position

(1) Insert the thickness gauge (t=0.1 mm) between the reel table rotation sensor and the reel table.

Note

Be careful not to damage the reel flange and the reel table rotation sensor.

(2) Rotate the reel table, and check that it rotates smoothly.

(3) Recheck that the specifications 1 through 4 are satisfied referring to steps 1 through 3.

5-15. Brake Lining Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Brake Assembly
3. Remove Brake Lining
4. Install the Brake Lining
5. Install the Brake Assembly
6. Install the Reel Table Assembly

Adjustment after Replacement

7. Confirm the Reel Table Height (Refer to section 5-14-1.)
8. Confirm the Reel Brake Clearance (Refer to section 5-14-2.)
9. Confirm the Reel Brake Release Amount (Refer to section 5-14-3.)

Notes

- The brake lining replacement is the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake lining is replaced.
  E ring (2.3) : 7-624-105-04

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L wrench (D = 1.5 mm) : 7-700-736-05
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

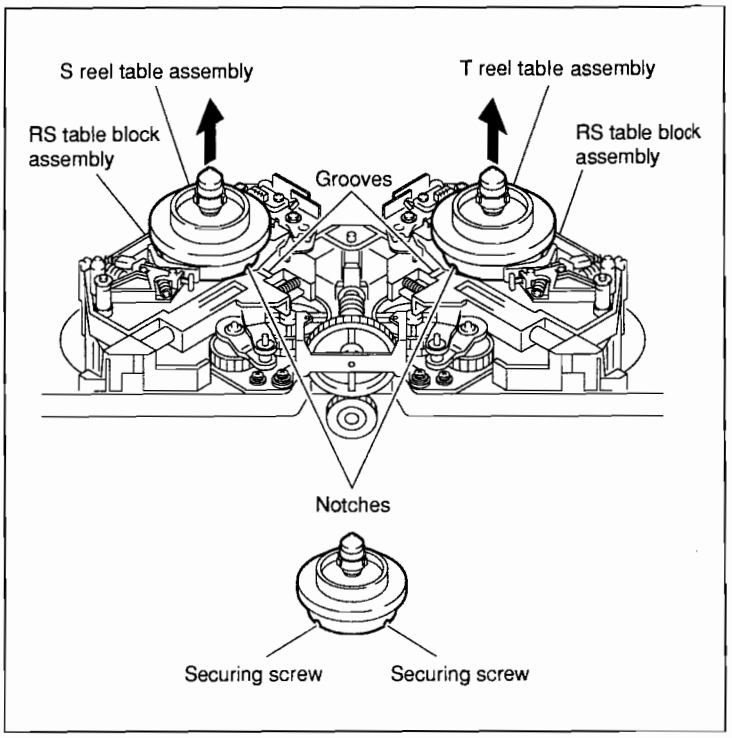
1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft.

The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

2. Remove the Brake Assembly

(1) Remove the spring from the RS table block assembly.
(2) Remove the E ring, then remove the brake assembly.

3. Remove the Brake Lining

Remove the spring from the brake arm block, then remove the brake lining.

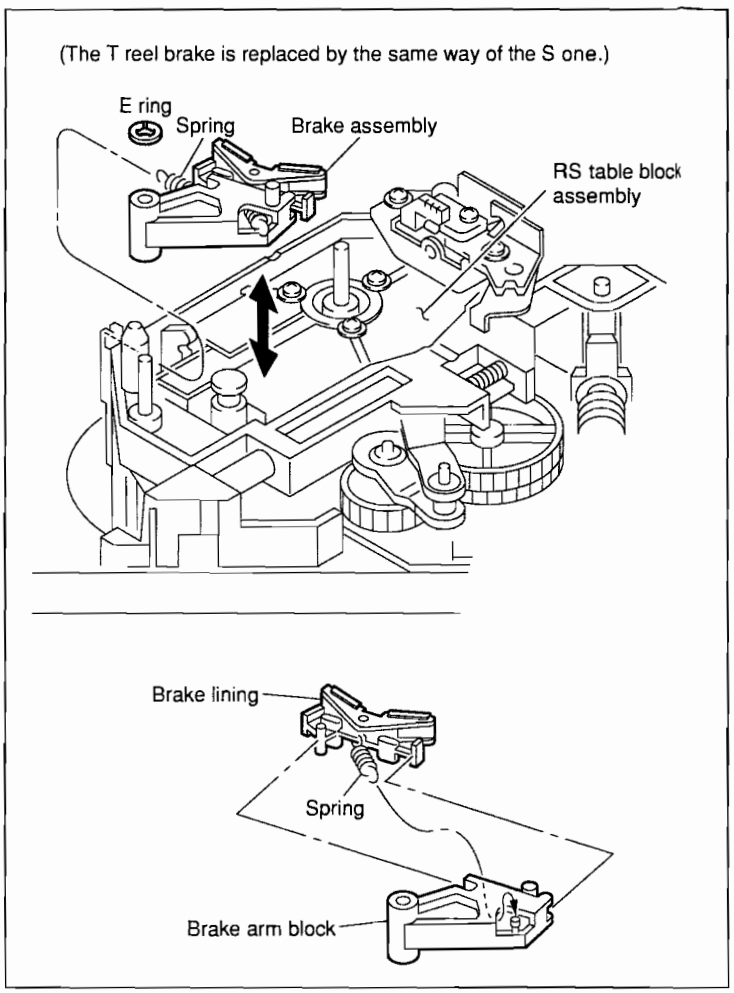
Installation

4. Install the Brake Lining

(1) Combine a new brake lining and brake arm block as shown in the figure.
(2) Hook the spring on the brake arm block.

5. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the RS table block assembly.
(2) Hook the spring on the RS table block assembly.
(3) Install the brake assembly using a new E ring.



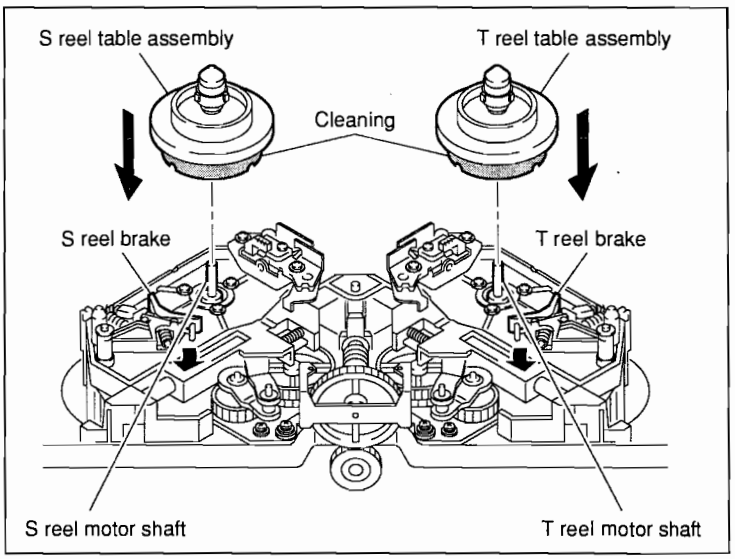
Brake Lining Removal/Installation

6. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the arrow direction to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two screws of the reel table assembly after reel table height adjustment.



Reel Table Assembly Installation

Adjustment after Replacement

7. Confirm the Reel Table Height

Refer to section 5-14-1.

8. Confirm the Reel Brake Clearance

Refer to section 5-14-2.

9. Confirm the Reel Brake Release Amount

Refer to section 5-14-3.

5-16. Reel Motor Assembly Replacement

Replace the reel motor assembly every 3,000 hours of tape running.

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Holder
3. Remove the RS Table Block Assembly
4. Disconnect the Harness
   (S side : CN926 and 927/RM Board, T side : CN926 and 927/RM Board)
5. Remove the Reel Motor Assembly
6. Cleaning
7. Install the Reel Motor Assembly
8. Connect the Harness
   (S side : CN926 and 927/RM Board, T side : CN926 and 927/RM Board)
9. Connect the Flat Cable (S side : CN923/RM Board, T side : CN923/RM Board)
10. Install the Slide Shaft
11. Install the RS Table Block Assembly
12. Smear Grease to the Slide Shaft
13. Install the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness (Refer to section 5-16-1.)
15. Install the Reel Table Assembly
16. Confirm the Cassette Pillar Height (Refer to section 5-16-2.)
17. Confirm the Reel Table Height (Refer to section 5-14-1.)
18. Confirm the Reel Brake Clearance (Refer to section 5-14-2.)
19. Confirm the Reel Brake Release Amount (Refer to section 5-14-3.)
20. Adjust the Rell Table Rotation Sensor Position (Refer to section 5-14-4.)
21. Confirm the Reel Motor Operation
    (Refer to section 4-3-2. 1 in maintenance manual part 1.)
    ([F 5] : S REEL MOTOR/[F 6] : T REEL MOTOR)
22. Adjust the Reel FG Duty
    (Refer to section 4-4-1. 1 in maintenance manual part 1.)
    ([F 3] : S REEL FG DUTY ADJUST/[F 4] : T REEL FG DUTYADJUST)
23. Adjust the Reel Offset/Friction
    (Refer to section 4-4-1. 1 in maintenance manual part 1.)
    ([F 6] : S REEL OFFSET/FRICTION/[F 7] : T REEL OFFSET/FRICTION)
24. Adjust the Reel Torque
    (Refer to section 4-4-1. 1 in maintenance manual part 1.)
    ([F 8] : S REEL TORQUE ADJUST/[F 9] : T REEL TORQUE ADJUST)
25. Save the Adjusted Data
    (Refer to section 4-4-1. 1 in maintenance manual part 1.)
    ([F 1] : NVRAM CONTROL)

Note

The parts consisting reel motor is different between S side and T side. However, how to replace the reel motor assembly is the same for both sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L-shaped wrench (D = 1.5 mm) : 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver's bit (+3 mm, L = 90 mm) : J-6323-430-A
- Grease (SGL-601) : 7-651-000-10
- Oil : 7-661-018-18
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

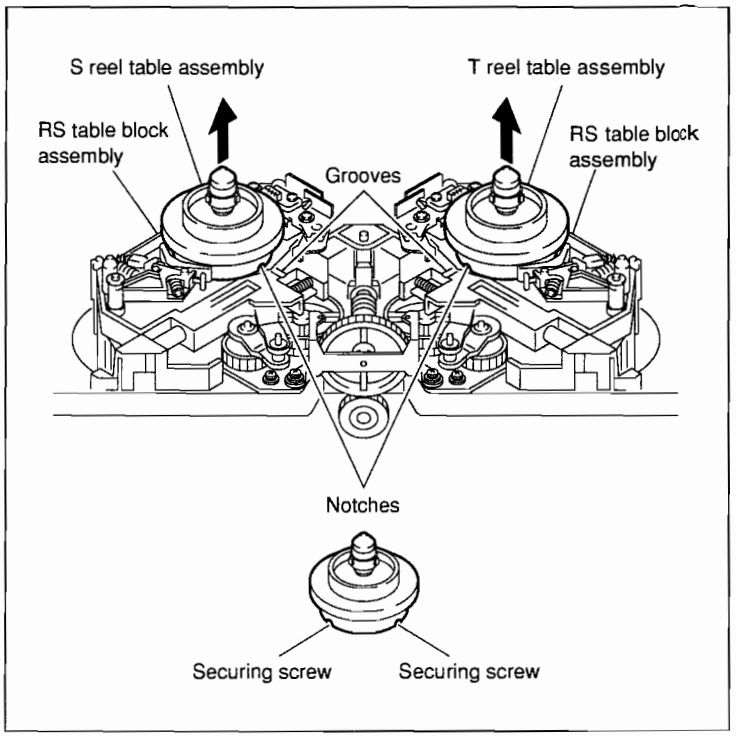
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove of the reel shift plate assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the reel shift plate assembly.
(3) Loosen the screw.
(4) Align another notch of the reel table assembly with the groove of the reel shift plate assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft position. This poly-slider washer is used for reel table height adjustment.



Reel Table Assembly Removal

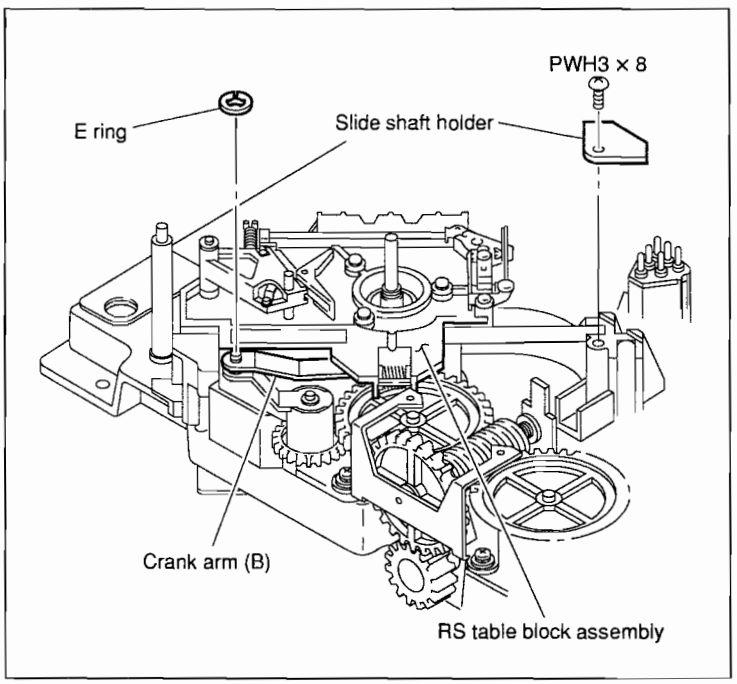
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove an E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft holder.



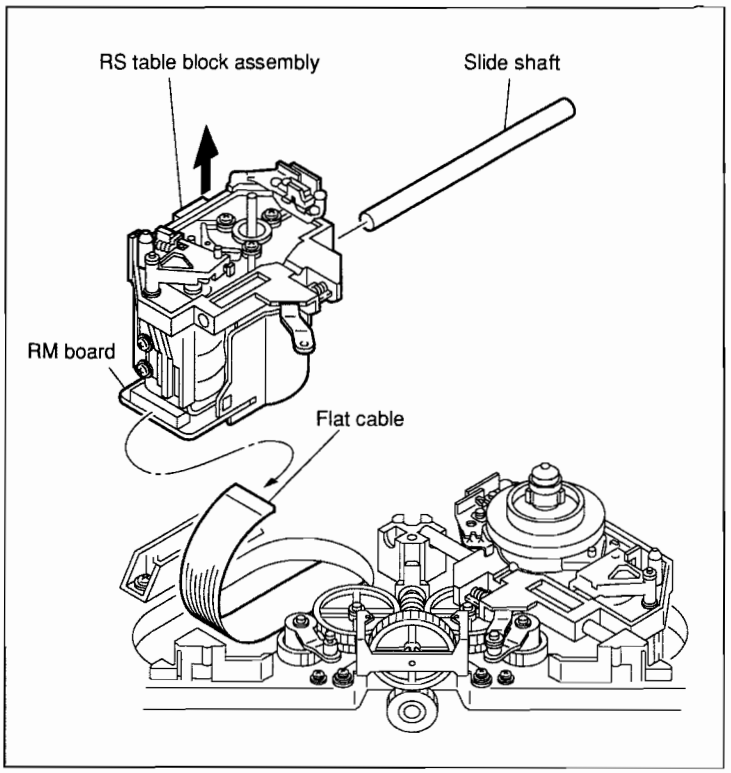
Crank Arm and Slide Shaft Holder Removal

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft and remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

Notes

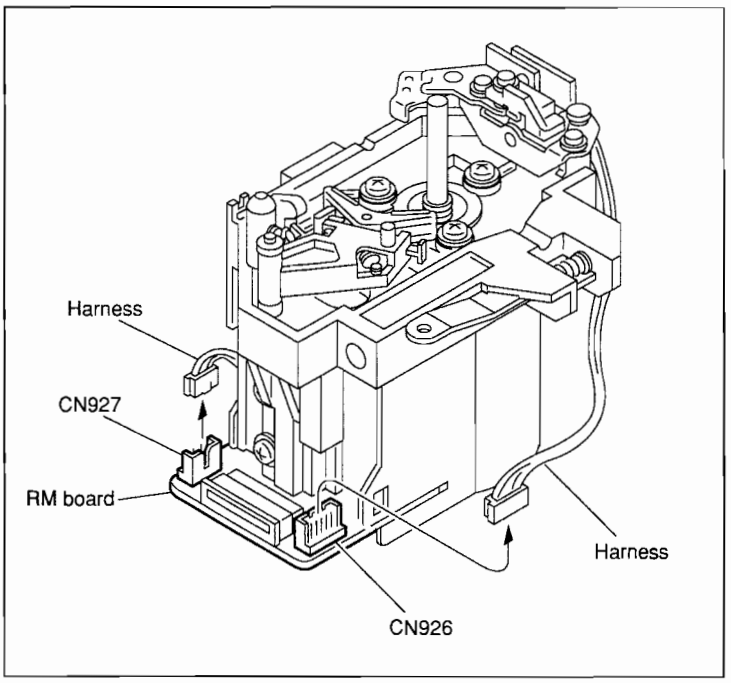
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



RS Table Block Assembly Removal

4. Disconnect the Harness

Disconnect the harness from the two connectors CN926 and CN927 on the RM board.



Harness Disconnection

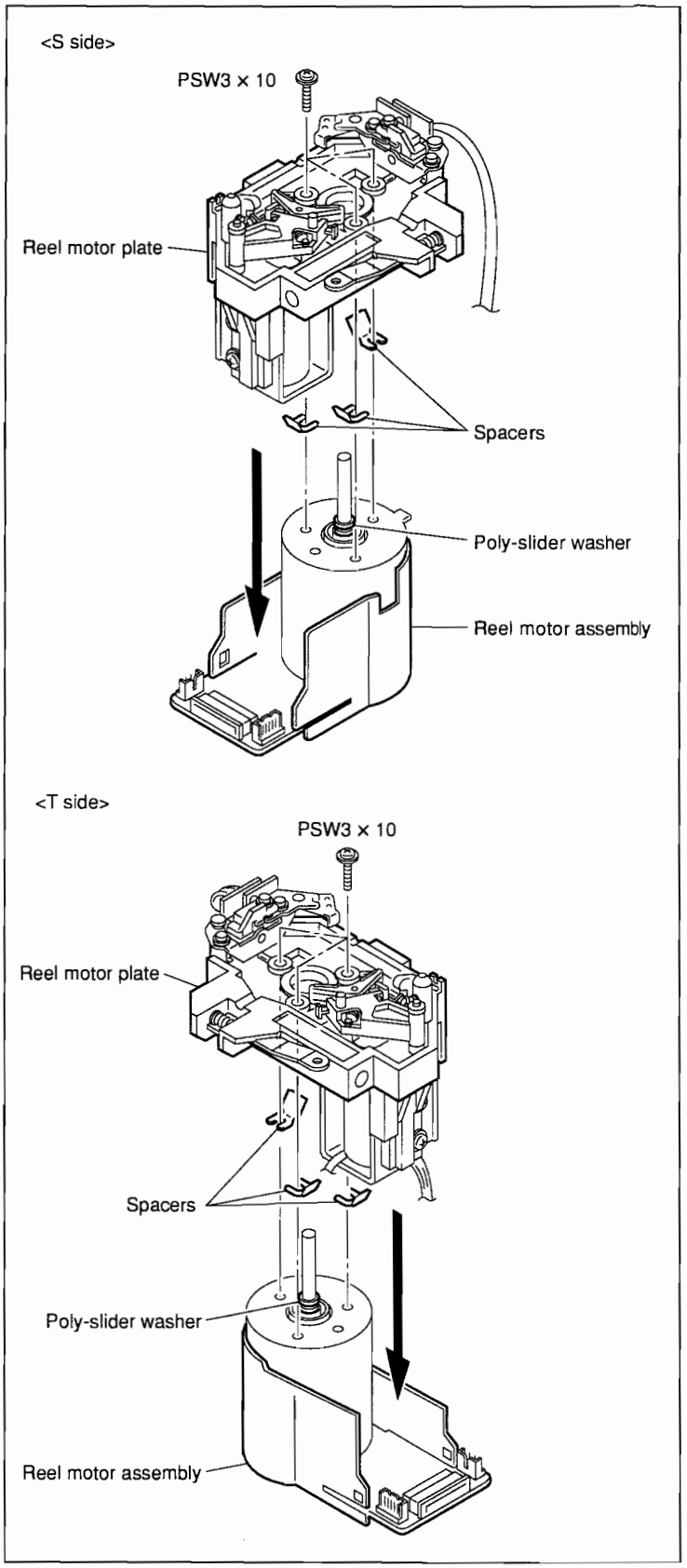
5. Remove the Reel Motor Assembly

(1) Remove the three screws and remove the reel motor assembly.

Note

The spacer(s) is inserted between the reel motor and the reel motor plate.
Be careful not to lose spacer(s) since it comes off with the reel motor assembly.

(2) Remove the poly-slider washer from the reel motor shaft.
Be careful not to loose the removed poly-slider washer.



Reel Motor Assembly Removal

Installation

6. Cleaning

Clean the reel motor assembly mounting surface and reel motor plate mounting surface.

7. Install the Reel Motor Assembly

(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

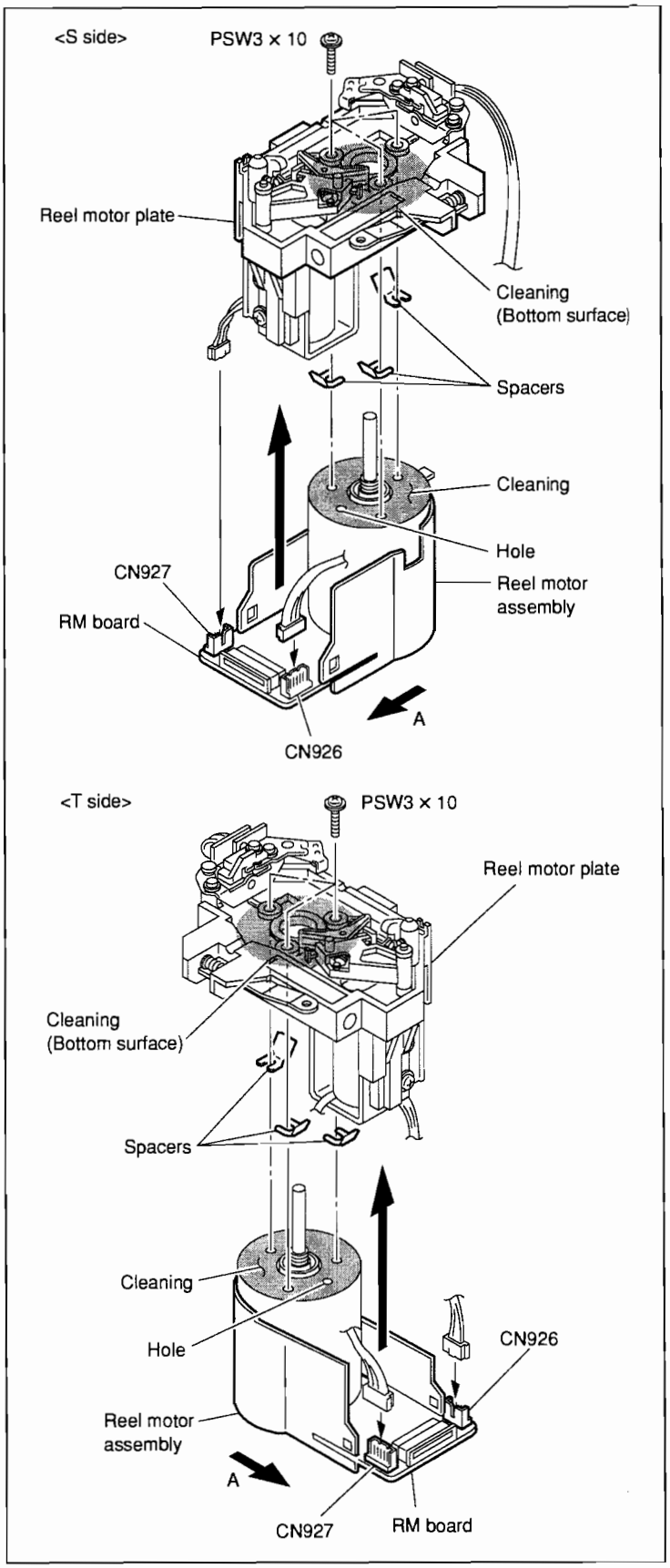
(2) Tighten the three screws gradually while moving the reel motor assembly in the arrow A direction.

Tightening torque : 68.6×10^{-2} N•m (7 kgf•cm)

(3) Pass the poly-slider washer removed in (2) of step 5 through the reel motor shaft.

8. Connect the Harness

Connect the harness to the two connectors CN926 and CN927 on the RM board.



Reel Motor Assembly Installation

9. Connect the Flat Cable

(1) Clean the insertion of the flat cable on the RM board with a dry cleaning cloth.

(2) Connect the flat cable disconnected in step 3 to the connector on the RM board.

Notes

- Connect the flat cable with its conductor side (printing surface) upside.
- Be careful not to twist the flat cable when connecting it.

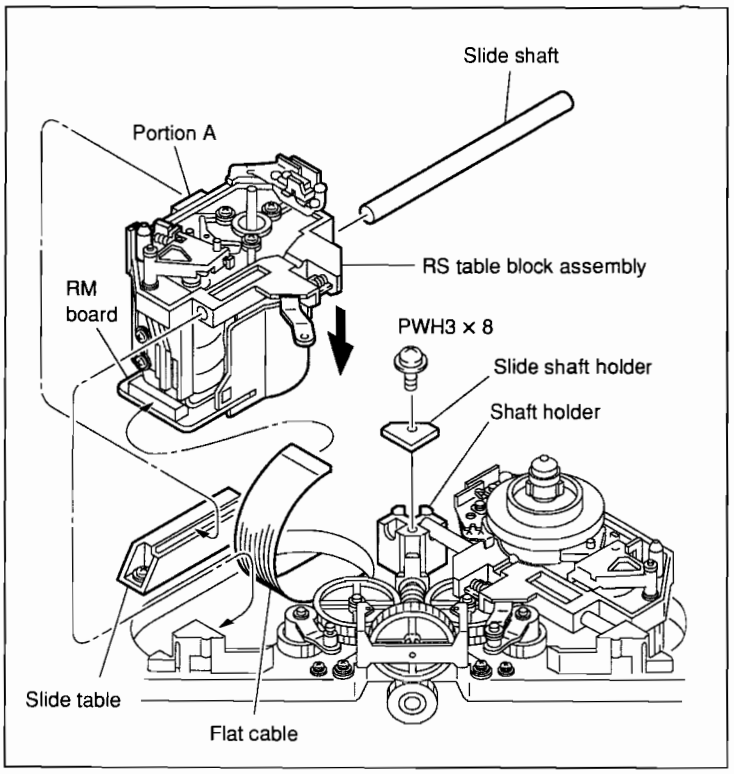
10. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

11. Install the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.

(2) Install the slide shaft holder.



RS Table Block Assembly Installation

12. Smear Grease to the Slide Shaft

(1) Smear grease very lightly to the slide shaft.

Note

Be careful that the grease does not adhere to other parts.

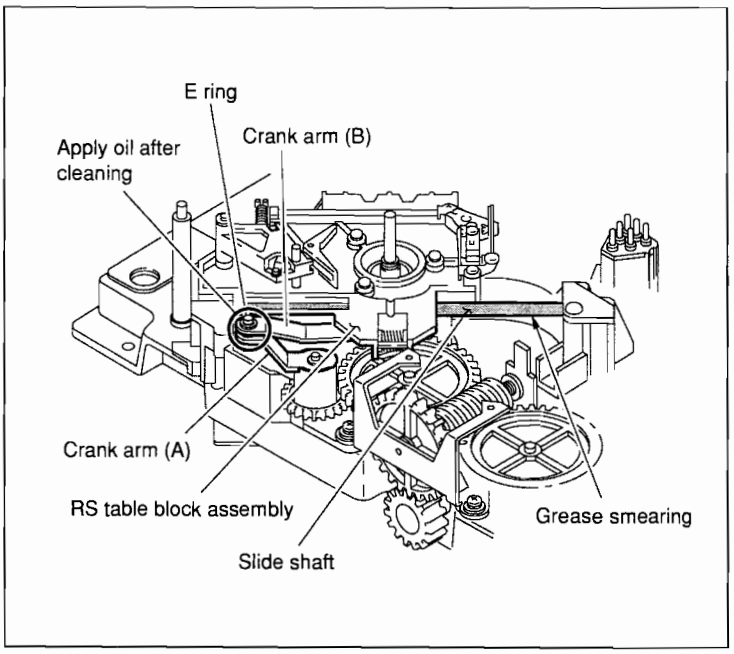
(2) Confirm that the RS table block assembly moves smoothly when moving it by hand towards S cassette and L cassette positions.

13. Install the Crank Arm

(1) Clean the shaft of the crank arm (A), then pour a drop of oil on it.

(2) Confirm that the RS table block assembly is in the intermediate position of S and L cassettes.

(3) Install the crank arm (B) to the shaft of the crank arm (A) with an E ring.



Smear Grease/Crank Arm Installation

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness

Refer to section 5-16-1.

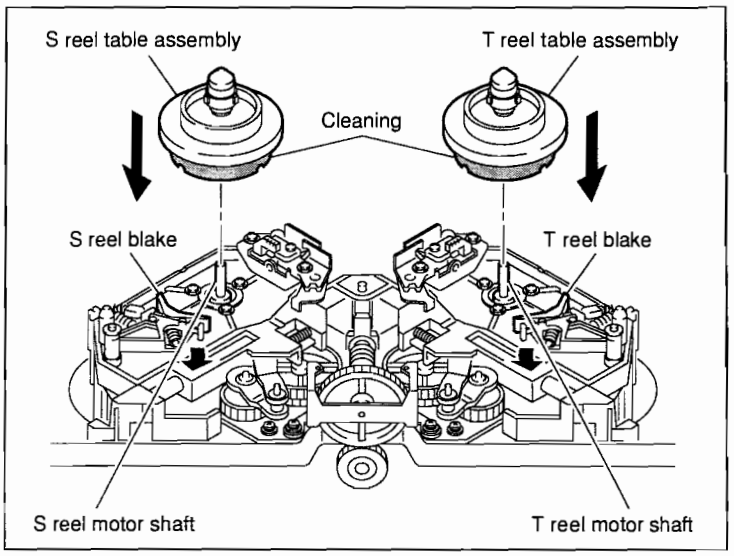
15. Install the Reel Table Assembly

(1) Clean the circumference of a new reel table assembly.

(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Install the Reel Table Assembly

16. Confirm the Cassette Pillar Height

Refer to section 5-16-2.

17. Confirm the Reel Table Height

Refer to section 5-14-1.

18. Confirm the Reel Brake Clearance

Refer to section 5-14-2.

19. Confirm the Reel Brake Release Amount

Refer to section 5-14-3.

20. Adjust the Reel Table Rotation Sensor Position

Refer to section 5-14-4.

21. Confirm the Reel Motor Operation

Refer to section 4-3-2. 1 in maintenance manual part 1.
([F 5] : S REEL MOTOR/[F 6] : T REEL MOTOR)

22. Adjust the Reel FG Duty

Refer to section 4-4-1. 1 in maintenance manual part 1.
([F 3] : S REEL FG DUTY ADJUST/[F 4] : T REEL FG DUTY ADJUST)

23. Adjust the Reel Offset/Friction

Refer to section 4-4-1. 1 in maintenance manual part 1.
([F 6] : S REEL OFFSET/FRICTION/[F 7] : T REEL OFFSET/FRICTION)

24. Adjust the Reel Torque

Refer to section 4-4-1. 1 in maintenance manual part 1.
([F 8] : S REEL TORQUE ADJUST/[F 9] : T REEL TORQUE ADJUST/)

25. Save the Adjusted Data

Refer to section 4-4-1. 1 in maintenance manual part 1.
([F 1] : NVRAM CONTROL)

5-16-1. Reel Motor Shaft Slantness Adjustment

Notes

- Be sure to check the slantness of the reel motor shaft when the reel motor assembly is removed or when the RS table block assembly is removed.
- Perform the reel motor shaft slantness adjustment correctly.
  If this adjustment is not performed correctly, a reel hub touches the case in a cassette tape, a noise occurs, and the tape does not run correctly. This may damage the tape.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel motor shaft slantness check tool (MW-087) : J-6320-870-A
- Thickness gauge : 9-911-053-00
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver's bit (+3 mm, L = 50 mm) : J-6323-430-A

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

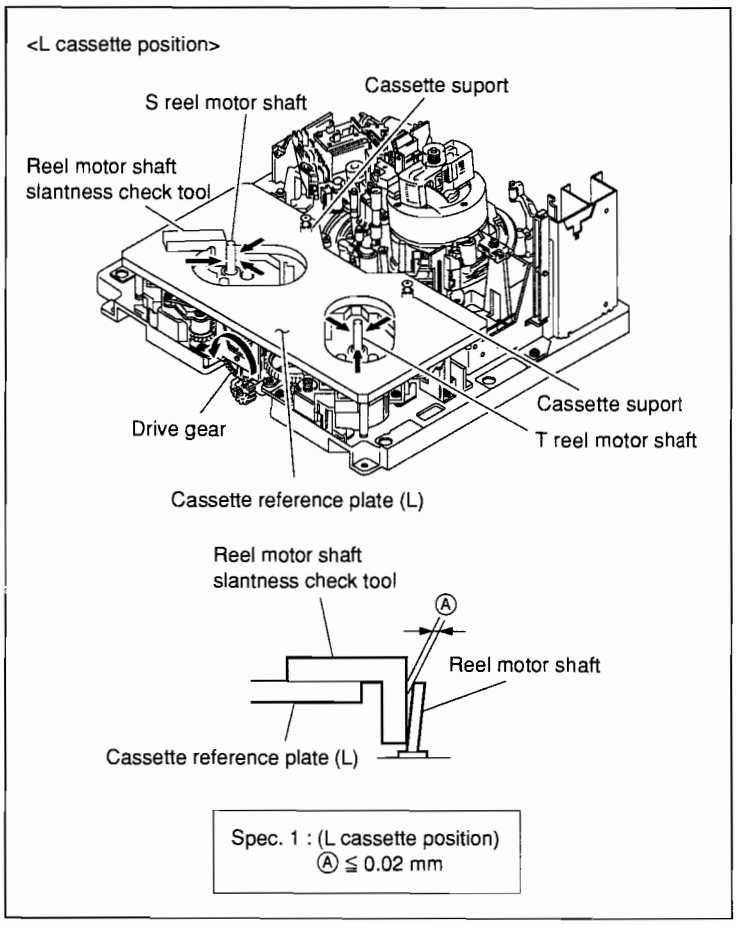
2. Place the RS Table Block Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Slantness in the L Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool meet the specification 1.

If the specification is not met, perform steps 6 through 10.



Reel Motor Shaft Slantness (L) Confirmation

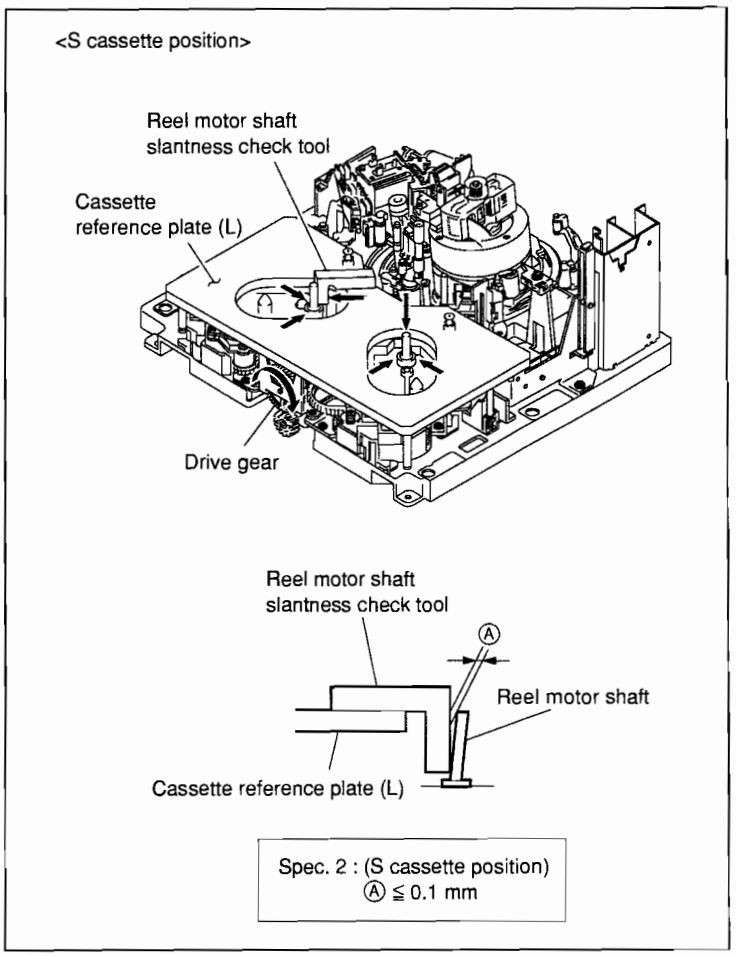
4. Place the RS Table Block Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

5. Check the Slantness in the S Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool meet the specification 2.

If the specification is not met, perform steps 6 and later.



Reel Motor Shaft Slantness (S) Confirmation

Adjustment

6. Loosen Screws

Loosen the three screws fixing the reel motor by one to two turns.

7. Bend Spacer

Bend the adjustment spacer as shown in the figure.

8. Insert Spacer

Insert the adjustment spacer into the square hole on the upper surface of the RS table block assembly with tweezers.

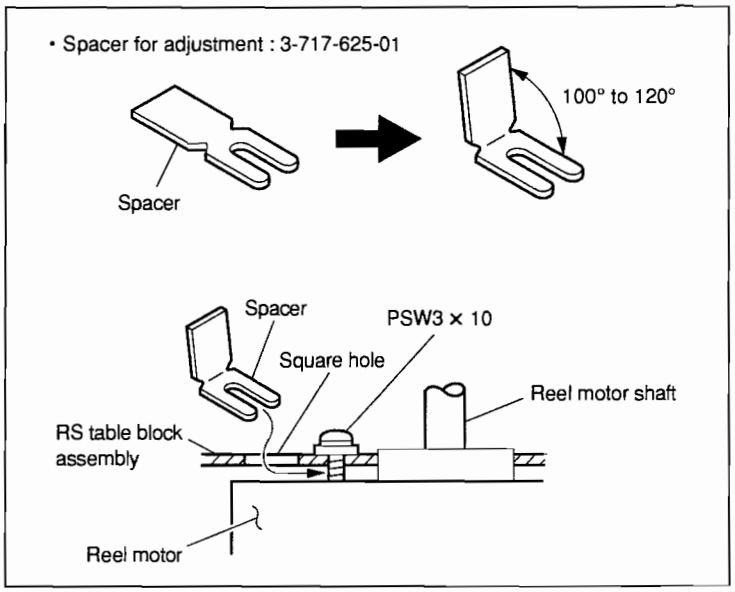
9. Tighten Screws

Gradually tighten the three screws loosened in step 6.

Tightening torque : 68.6 × 10^{-2} N•m (7 kgf•cm)

10. Recheck the Reel Motor Shaft Slantness

Refer to steps 2 through 5.



Reel Motor Shaft Slantness Adjustment

5-16-2. Cassette Pillar Height Adjustment

Note

- Be sure to check the height of the cassette pillars when the RS table block assembly is removed.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Small dental mirror (round type) : J-6080-029-A
- L-shaped wrench (D = 1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette pillars.

2. Place the RS Table Block Assembly in the Intermediate Position of S and L Cassettes

(1) Rotate the drive gear and place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly should be moved to the position where the cassette pillars do not appear from the hole of the cassette reference plate (L).

(2) Check that the S and T cassette pillars are positioned under the cassette reference plate (L).

3. Check the Cassette Pillar Height

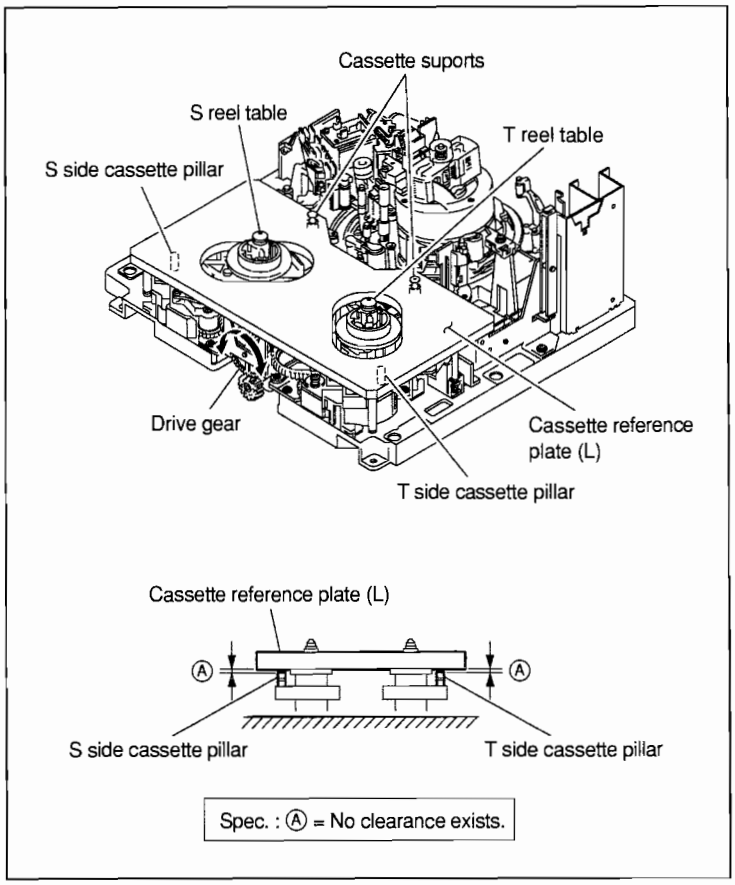
(1) Turn the casstte reference plate (L) over and place it on the cassette pillars.

Note

The reference plate should be turned over because it has a concave portion at the back of the cassette reference plate (L) and cannot be adjusted correctly.

(2) Check with a small dental mirror that there are no clearances between the S and T cassette pillars and the reference plate (L).

If check result is out of specification, perform steps 4 through 6.



Cassette Pillar Height Confirmation

Adjustment

4. Loosen Securing Screw

Loosen the securing screw of the S or T cassette pillar by one to two turns.

5. Adjust the Cassette Pillar Height

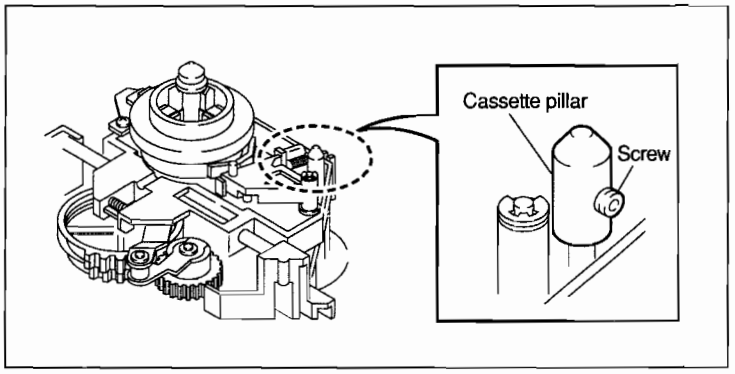
Lift the cassette pillar and press it slightly against the lower surface of the cassette reference plate (L). Tighten the securing screw under this condition.

6. Recheck the Cassette Pillar Height

Check that the height of the S and T cassette pillars meet the specification.

Note

Shift the tightening position of the fixing screw when performing readjustment with the specification not met. (Never tighten the screw in the same position as previous.)



Cassette Pillar Height Adjustsment

5-17. Brake Solenoid Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Holder
3. Remove the RS Table Block Assembly
4. Disconnect the Harness (CN926 and CN927/RM Board)
5. Remove the Reel Motor Assembly
6. Remove the Brake Assembly
7. Remove the Brake Solenoid
8. Install the Brake Solenoid
9. Install the Brake Assembly
10. Cleaning (Reel Motor Assembly)
11. Install the Reel Motor Assembly
12. Connect the Harness (CN926 and CN927/RM Board)
13. Connect the Flat Cable
14. Install the Slide Shaft
15. Install the RS Table Block Assembly
16. Smear Grease to Slide Shaft
17. Install the Crank Arm

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness (Refer to section 5-16-1.)
19. Install the Reel Table Assembly
20. Confirm the Cassette Pillar Height (Refer to section 5-16-2.)
21. Confirm the Reel Table Height (Refer to section 5-14-1.)
22. Confirm the Reel Brake Clearance (Refer to section 5-14-2.)
23. Confirm the Reel Brake Release Amount (Refer to section 5-14-3.)
24. Confirm the Brake Solenoid Operation
    (Refer to section 4-3-2. 2 in maintenance manual part 1.)
    (F 4 : S REEL BRAKE/ F 5 : T REEL BRAKE)

Notes

- The brake solenoid replacement and its adjustment after replacement are the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake solenoid is replaced.
  E ring (2.3) : 7-624-105-04

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual Ppart1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L wrench (D = 1.5 mm) : 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver bit (+3 mm, L = 90 mm) : J-6323-430-A
- Grease (SGL-601) : 7-651-000-10
- Oil : 7-661-018-18
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

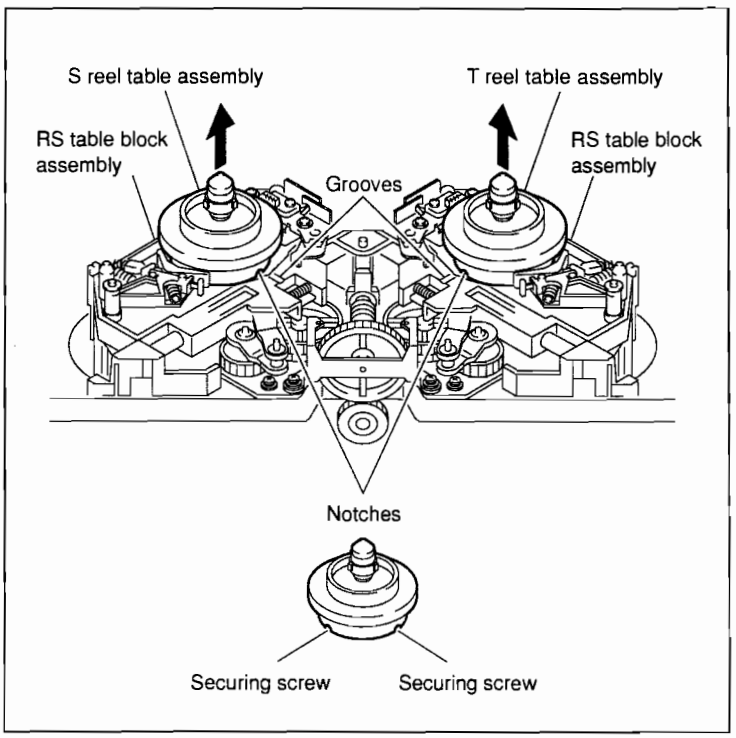
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the screw.
(4) Align another notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft.
This poly-slider washer is used for reel table height adjustment.



Reel Table Assembly Removal

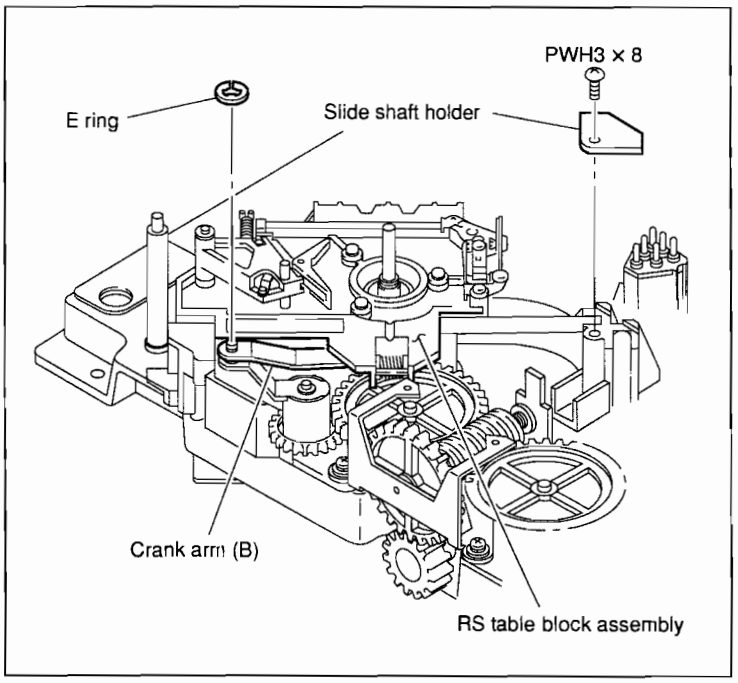
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove an E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft holder.



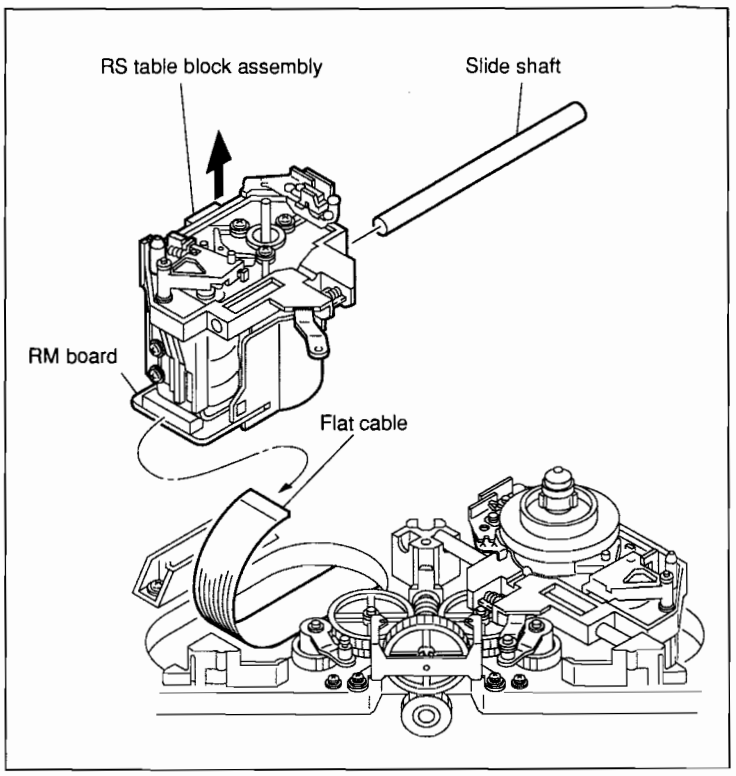
Crank Arm and Slide Shaft Holder Removal

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft and remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

Notes

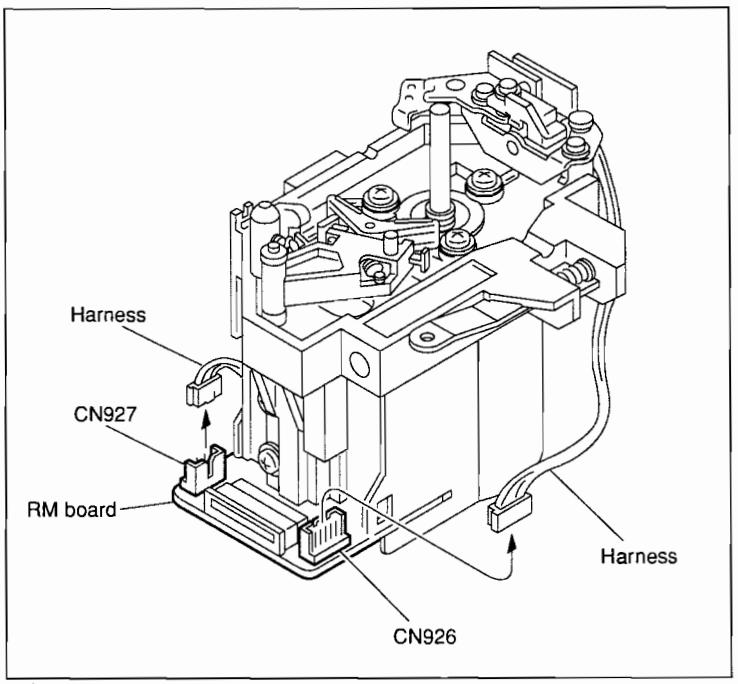
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



RS Table Block Assembly Removal

4. Disconnect the Harness

Disconnect the harness from the two connectors CN926 and CN927 on the RM board.



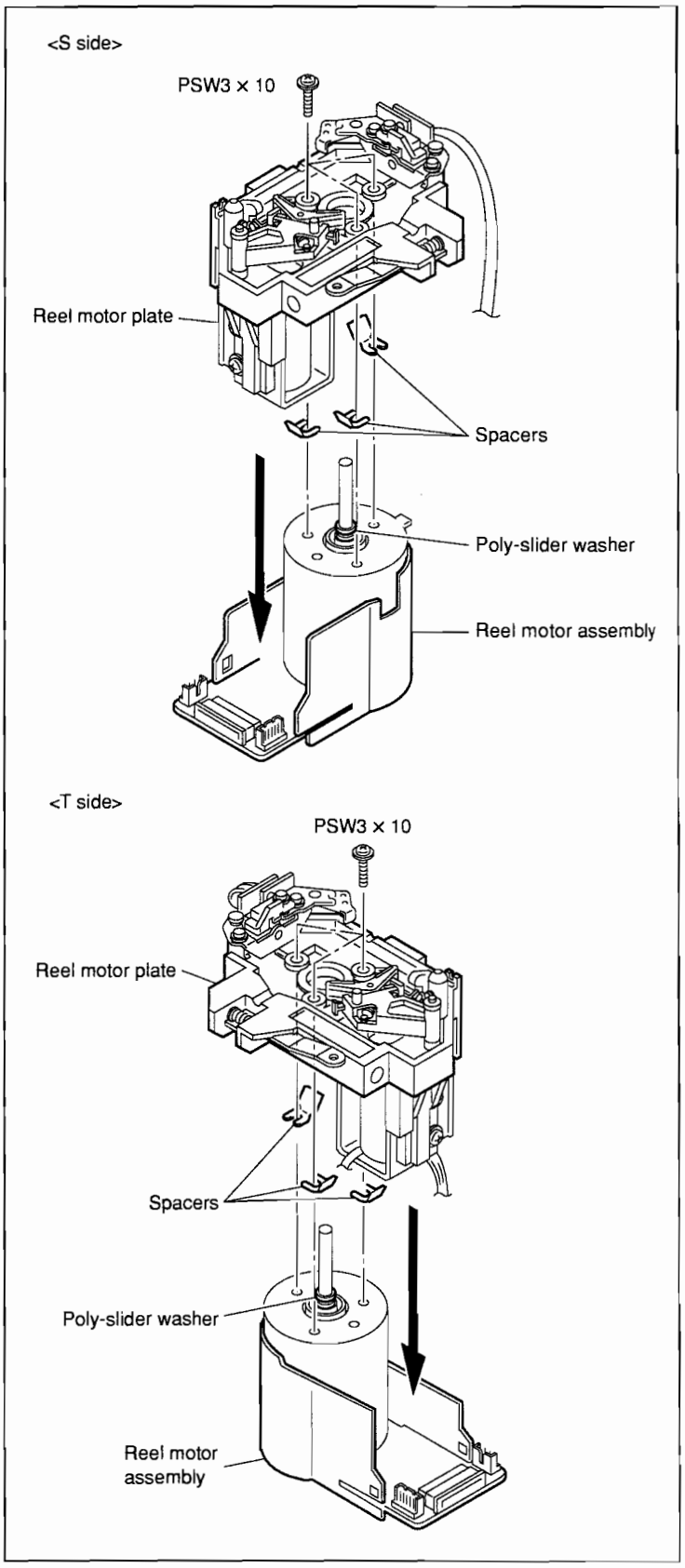
Harness Disconnection

5. Remove the Reel Motor Assembly

Remove the three screws, then remove the reel motor assembly.

Notes

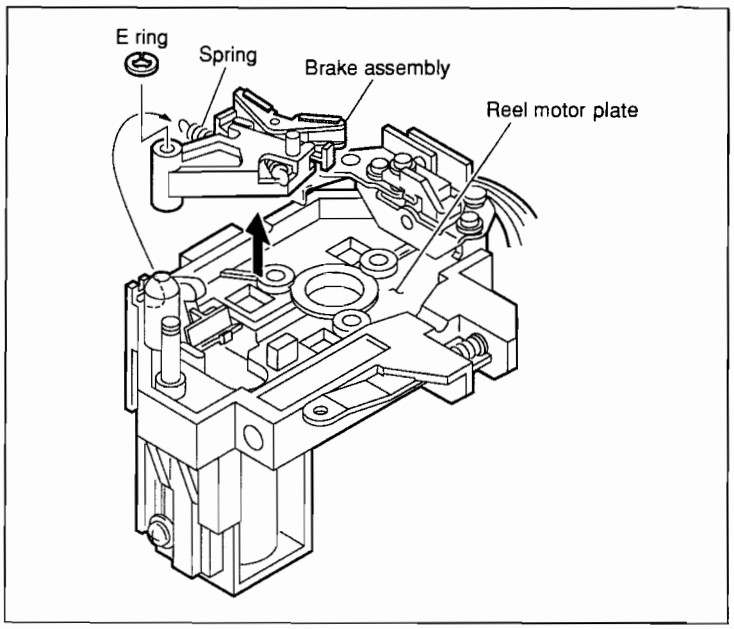
- Spacers are inserted between the reel motor and reel motor plate.
  These spacers are also removed together when the reel motor assembly is removed. Be careful not to lose them.
- Do not remove the poly-slider washer that is passed through the reel motor shaft.



Reel Motor Assembly Removal

6. Remove the Brake Assembly

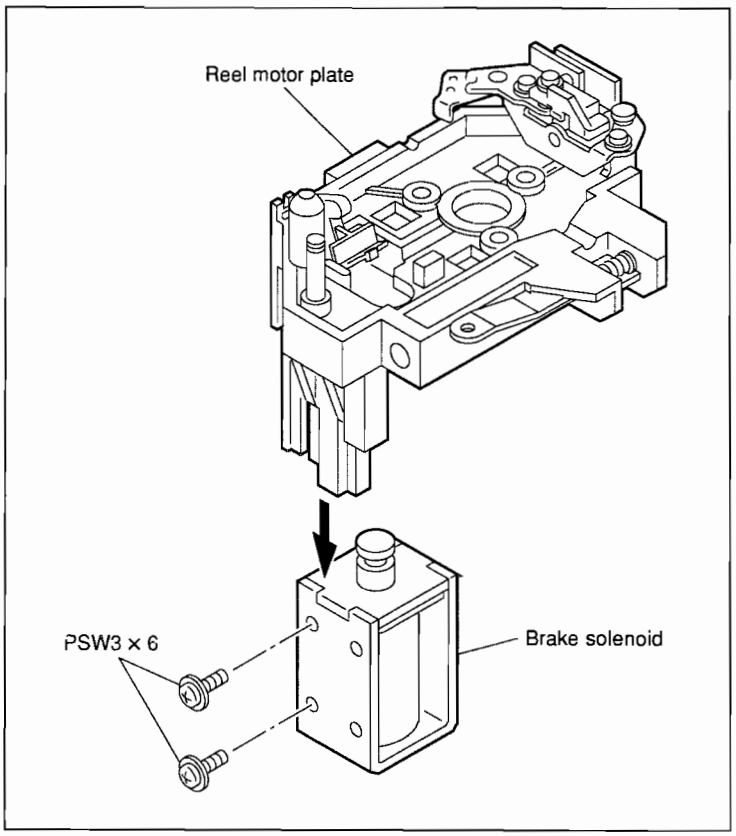
(1) Remove the spring from the reel shift plate.
(2) Remove the E ring, then remove the brake.



Brake Assembly Removal

7. Remove the Brake Solenoid

Remove the two screws, then remove the brake solenoid.

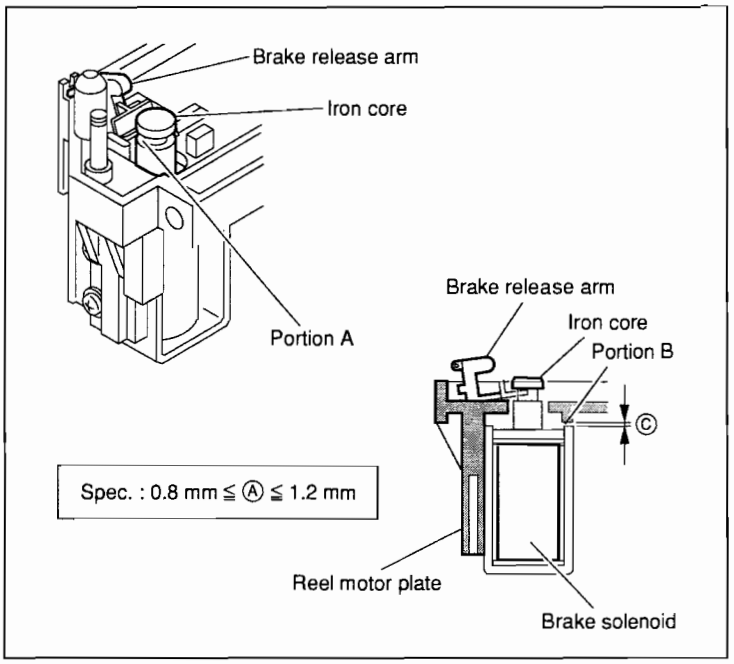


Brake Solenoid Removal

Installation

8. Install the Brake Solenoid

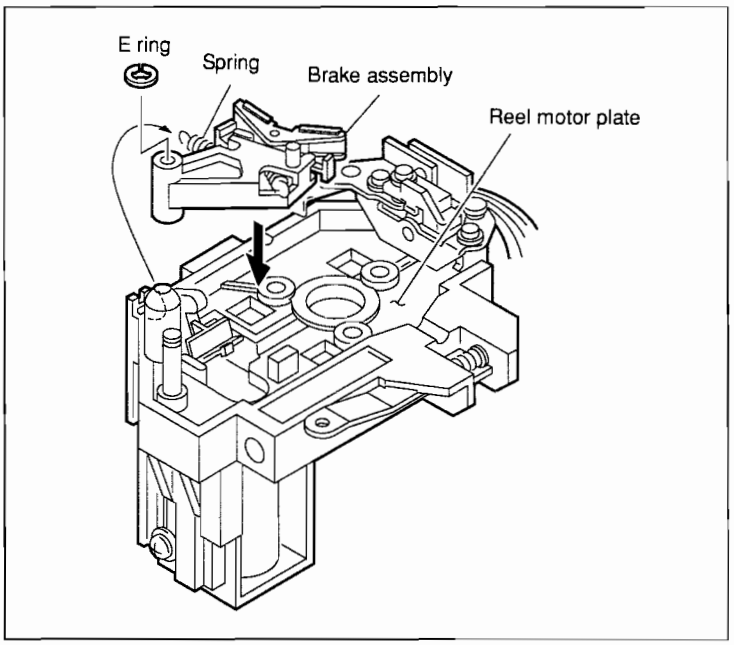
(1) Attach the brake solenoid temporary with two screws while inserting portion A of the brake release arm into the groove of the iron core.
(2) Put a thickness gauge (1.00 mm thick) between the solenoid and reel motor plate (portion B).
(3) Tighten the screws while pushing the solenoid slightly against the reel motor plate.
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the solenoid and reel motor plate meets the specification.



Brake Solenoid Installation

9. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the reel motor plate.
(2) Put the spring on the reel motor plate.
(3) Fix the brake assembly using an E-ring.
E ring (2.3) : 7-624-105-04



Brake Assembly Installation

10. Cleaning

Clean the reel motor assembly mounting surface and reel motor plate mounting surface.

11. Install the Reel Motor Assembly

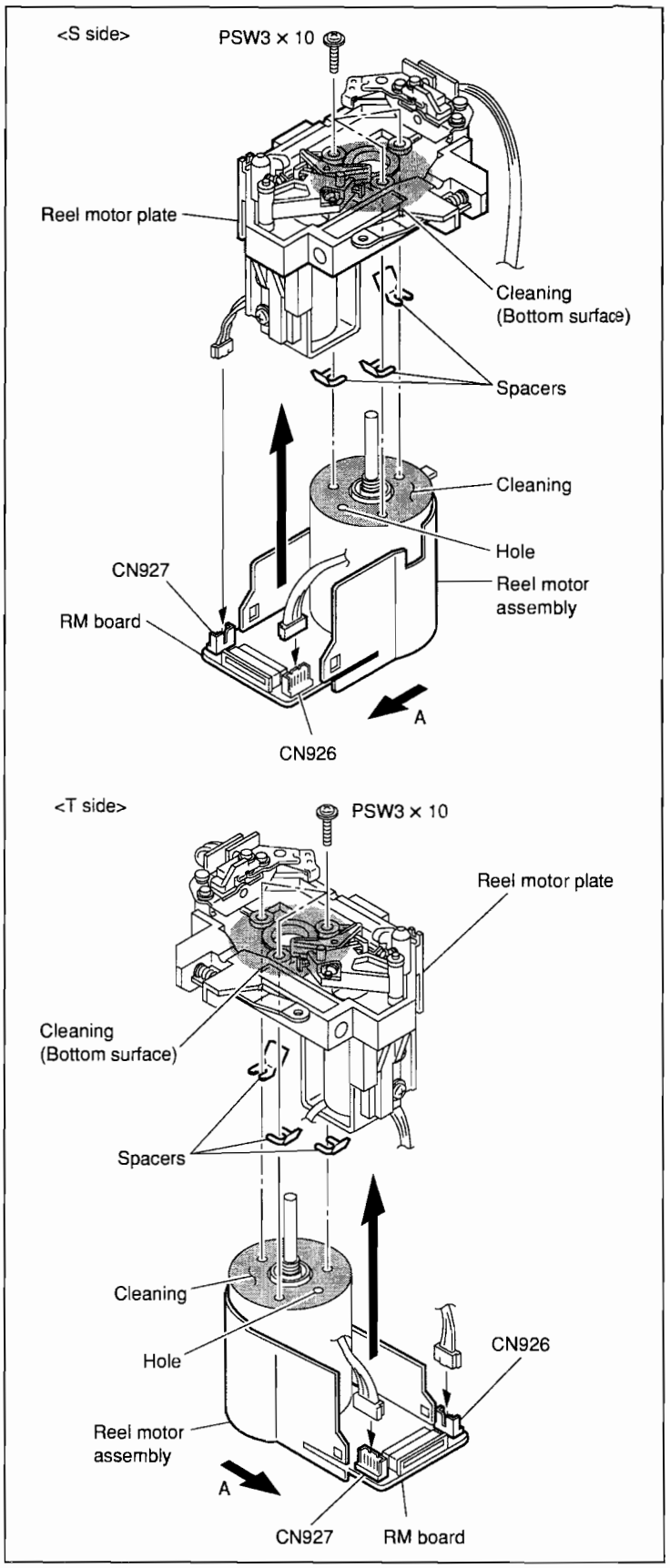
(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

(2) Tighten the three screws gradually while moving the reel motor assembly in the arrow A direction.

Tightening torque : 68.6×10^{-2} N•m (7 kgf•cm)

12. Connect the Harness

Connect the harness to the two connectors CN926 and CN927 on the RM board.



Reel Motor Assembly Installation

13. Connect the Flat Cable

(1) Clean the insertion of the flat cable on the RM board with a dry cleaning cloth.

(2) Connect the flat cable disconnected in step 3 to the connector on the RM board.

Notes

- Connect the flat cable with its conductor side (printing surface) upside.
- Be careful not to twist the flat cable when connecting it.

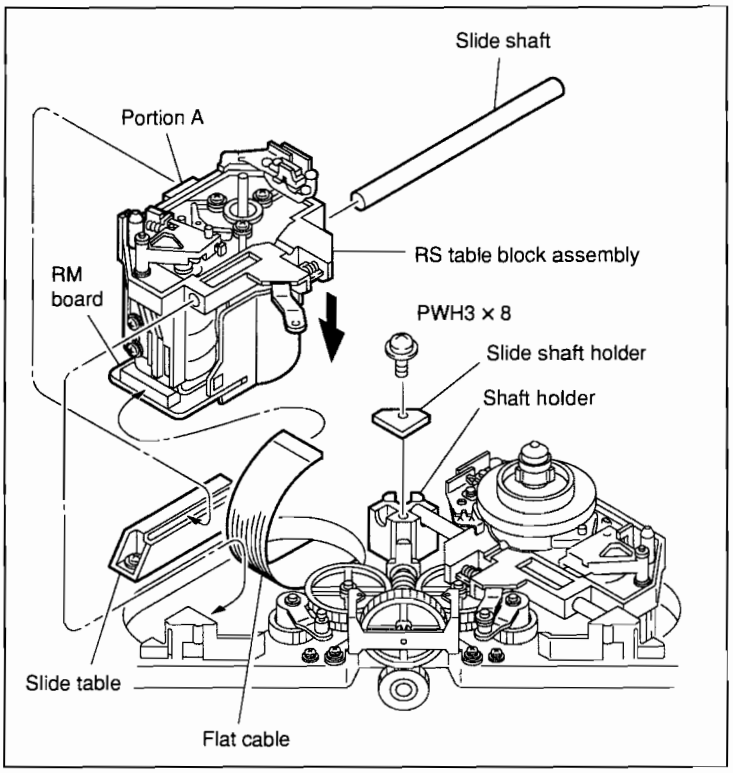
14. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

15. Install the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.

(2) Install the slide shaft holder.



RS Table Block Assembly Installation

16. Smear Grease to the Slide Shaft

(1) Smear grease very lightly to the slide shaft.

Note

Be careful that the grease does not adhere to other parts.

(2) Confirm that the RS table block assembly moves smoothly when moving it by hand towards S cassette and L cassette positions.

17. Install the Crank Arm

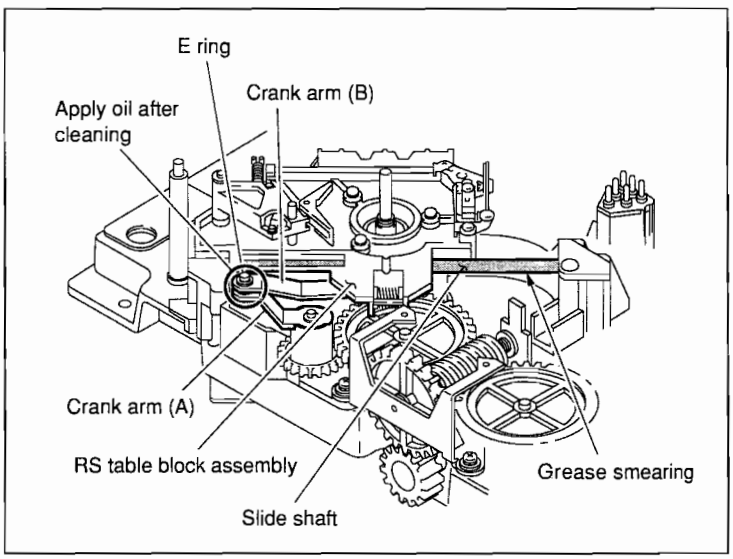
(1) Clean the shaft of the crank arm (A), then pour a drop of oil on it.

(2) Confirm that the RS table block assembly is in the intermediate position of S and L cassettes.

Note

Install the crank arm in the intermediate position of S and L cassettes for the adjustment of gear phase.

(3) Install the crank arm (B) to the shaft of the crank arm (A) with an E ring.



Smear Grease to Slide Shaft/Crank Arm Installation

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness

Refer to section 5-16-1.

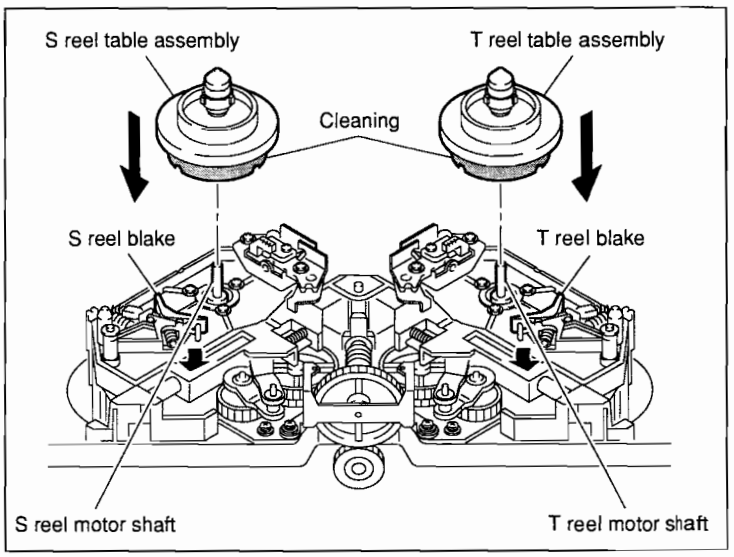
19. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Reel Table Assembly Installation

20. Confirm the Cassette Pillar Height

Refer to section 5-16-2.

21. Confirm the Reel Table Height

Refer to section 5-14-1.

22. Confirm the Reel Brake Clearance

Refer to section 5-14-2.

23. Confirm the Reel Brake Release Amount

Refer to section 5-14-3.

24. Confirm the Brake Solenoid Operation

Refer to section 4-3-2. 2 in maintenance manual part 1.

([F 4] : S REEL BRAKE/[F 5] : T REEL BRAKE)

5-18. Reel Shift Gear Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 of section 5-16.)
2. Remove the SE-435 Board
3. Remove the Reel Shift Gear
4. Remove the Crank Gear
5. Install the Crank Gear
6. Install the Reel Shift Gear
7. Smear Grease (Warm Gear)
8. Install the SE-435 Board
9. Install the RS Table Block Assembly
   (Refer to procedures 9 through 13 in section 5-16.)
10. Confirm the Reel Shift Gear Operation

Adjustment after Replacement

11. Confirm the Cassette Pillar Height (Refer to section 5-16-2.)

Notes

- This section describes the reel shift gear replacement. The replacement of the warm wheel, crank gear, and crank arm is also the same as for this replacement procedure.
- Procedures 3 and 4 are not required when the reel shift gear or warm wheel is replaced.
- Use a new stop washer when the reel shift gear, warm wheel, crank gear, and crank arm are replaced.
  Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper Lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Oil : 7-661-018-18
- Grease (SGL-601) : 7-651-000-10
- Cleaning fluid : 9-919-573-01
- Cleaning cloth : 3-184-527-01

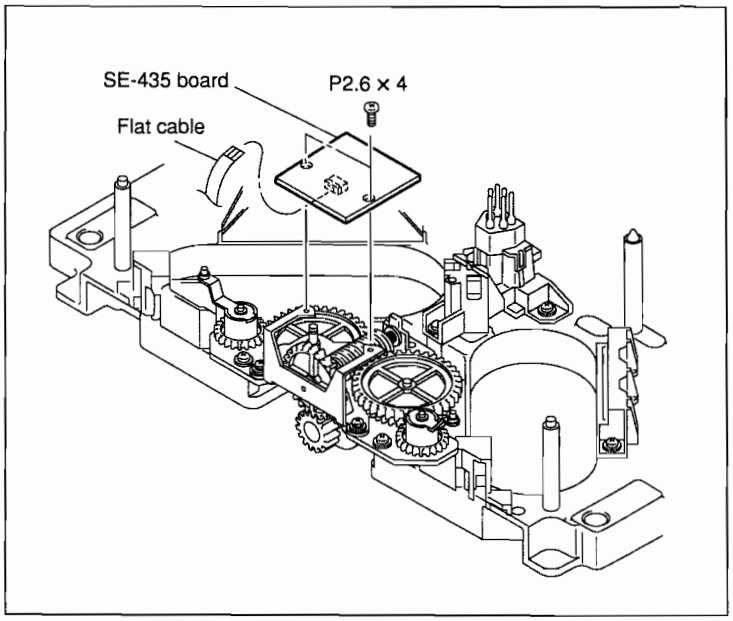
Removal

1. Remove the RS Table Block Assembly

Remove the RS table block assembly with the reel table assembly attached.
(Refer to procedures 1 through 3 of section 5-16.)

2. Remove the SE-435 Board

(1) Disconnect the flat cable from the connector on the SE-435 board.
(2) Remove the two screws, then remove the SE-435 board from the bracket.



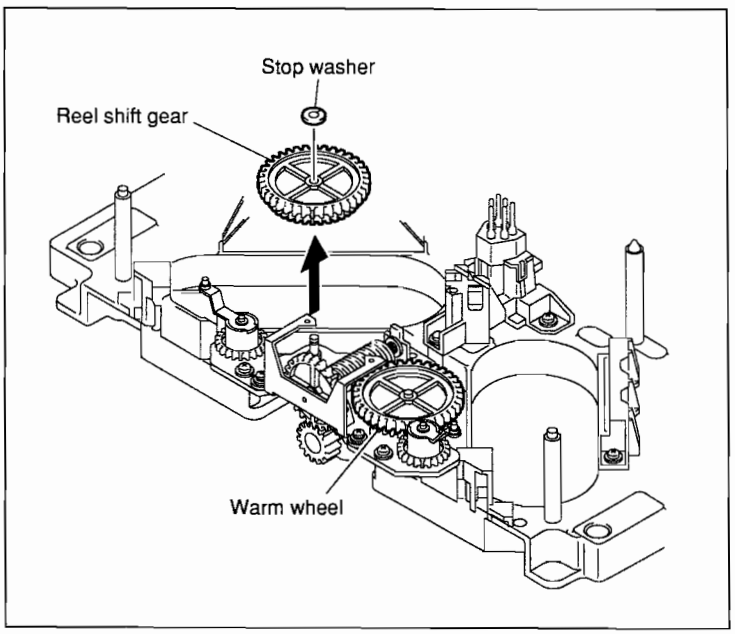
SE-435 Board Removal

3. Remove the Reel Shift Gear

Remove the stop washer, then remove the reel shift gear.

Note

Do not reuse the stop washer.



Reel Shift Gear Removal

4. Remove the Crank Gear

(1) Remove the stop washer, then remove the crank gear.
(2) Take out the crank arm from the crank gear.

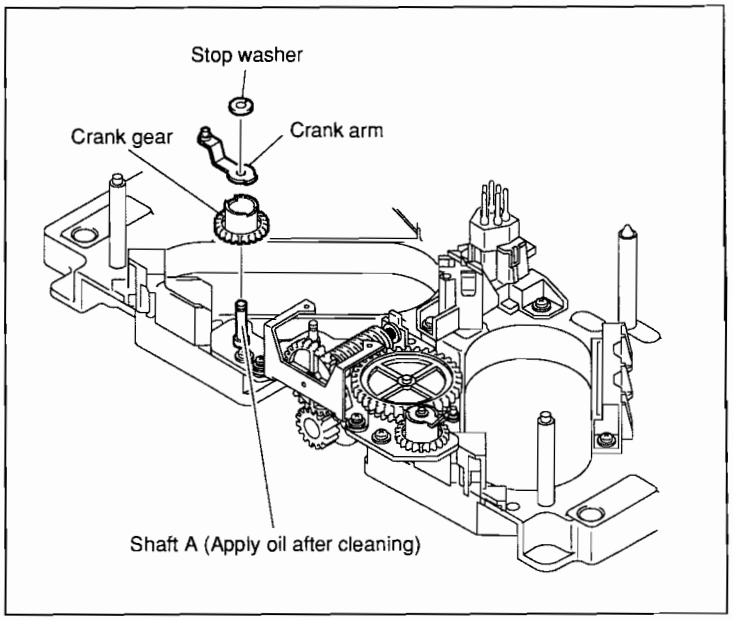
Note

Do not reuse the stop washer.

Installation

5. Install the Crank Gear

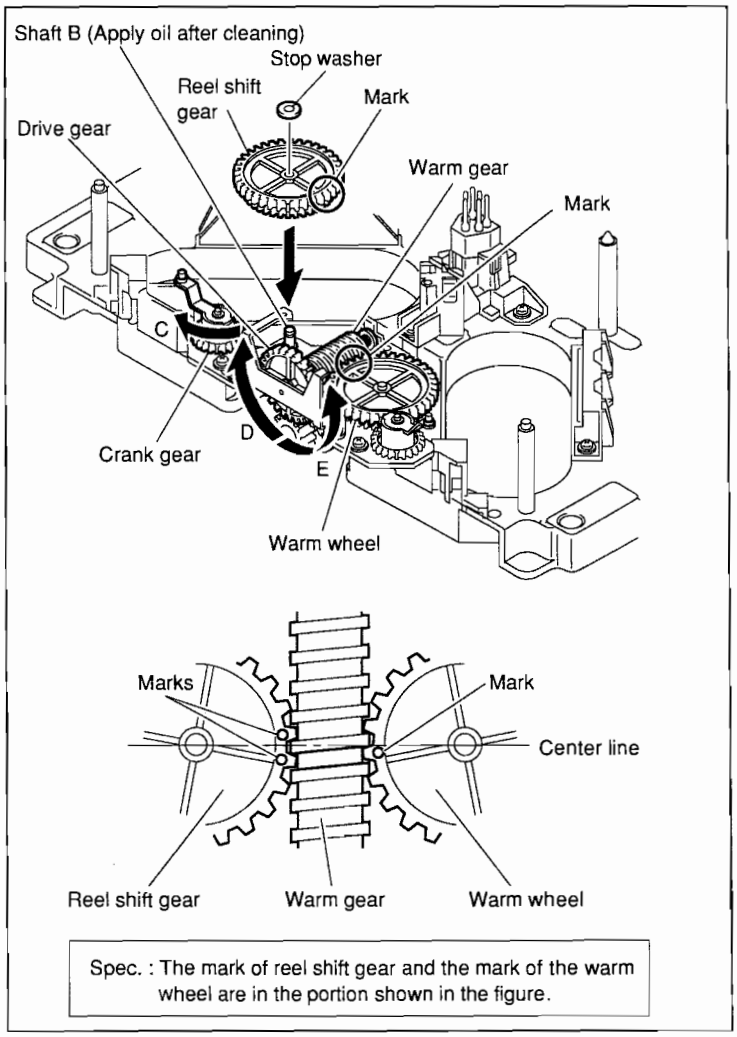
(1) Clean shaft A.
(2) Apply one drop of oil to shaft A.
(3) Combine the crank arm with the crank gear.
(4) Pass the crank gear through the shaft A.
(5) Fix the crank gear using a new stop washer.



Crank Gear Removal/Installation

6. Install the Reel Shift Gear

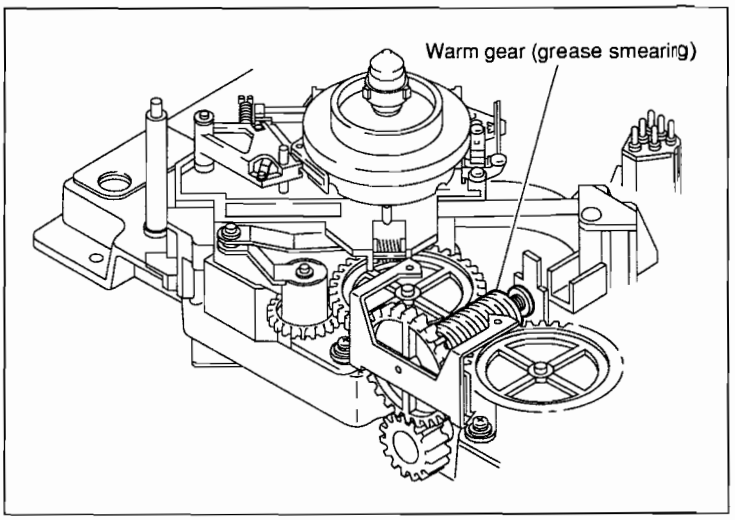
(1) Clean shaft B.
(2) Apply one drop of oil to shaft B.
(3) Turn the crank gear fully in the arrow C direction.
(4) Turn the drive gear and put the mark of the warm wheel in the illustrated position.
(5) Align the mark of the reel shift gear with that of the warm wheel and pass the reel shift gear through shaft B while engaging it with the warm gear and crank gear.
(6) Rotate the drive gear in the arrow D direction by three to five turns, then rotate it fully in the arrow E direction. At that time, confirm that the reel shift gear and warm wheel meets the specification.
(7) Fix the reel shift gear using a stop washer.



Reel Shift Gear Installation

7. Smear Grease

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.



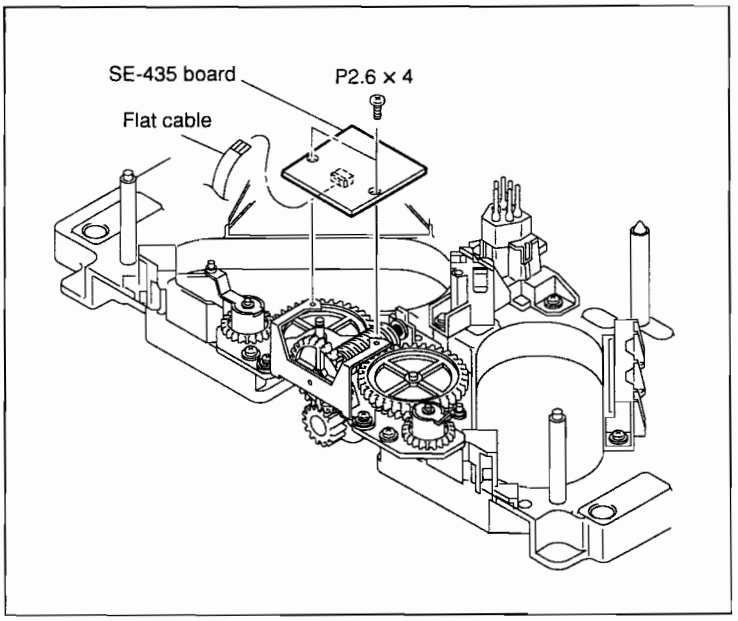
Grease Smearing

8. Install the SE-435 Board

(1) Install the SE-435 board with two screws.
(2) Connect the flat cable to the connector on the SE-435 board.

9. Install the RS Table Block Assembly

Refer to procedures 9 through 13 of section 5-16.

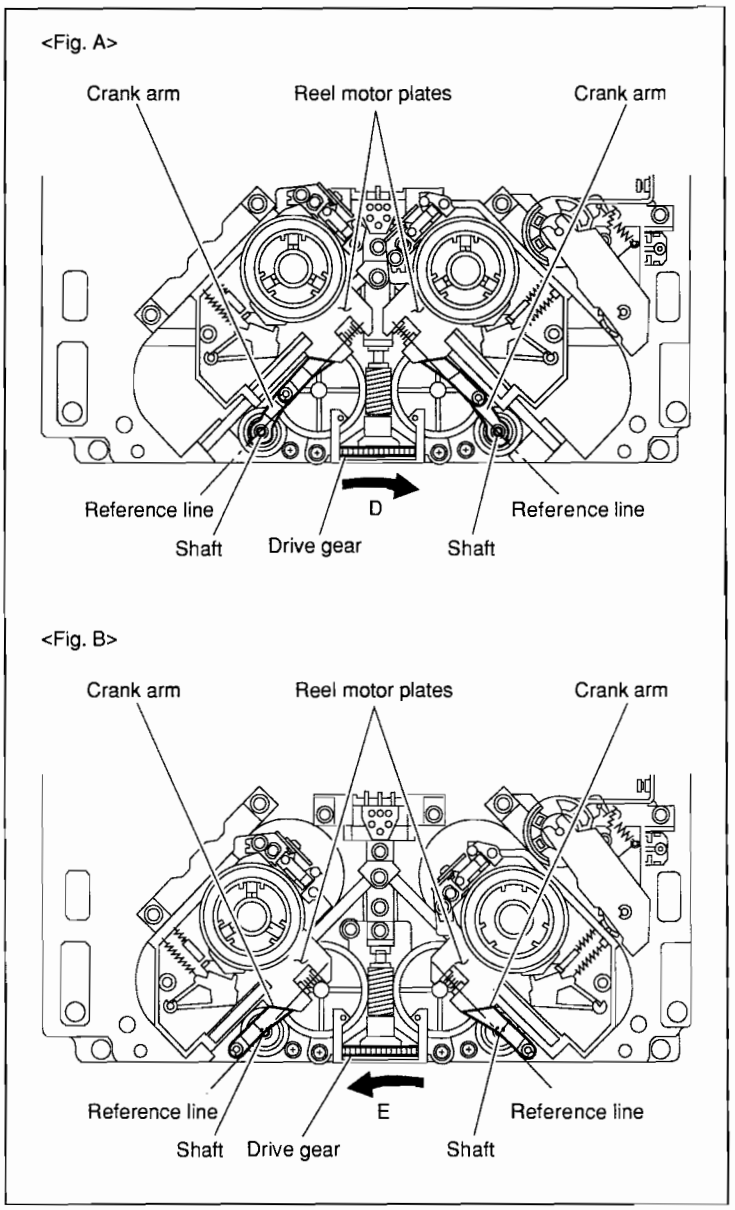


SE-435 Board Installation

10. Confirm the Reel Shift Gear Operation

(1) Confirm that the crank arms on the supply and take-up sides operate in the same phase while turning the drive gear in the arrows D and E directions.

(2) Confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow D until it stops. (Fig. A) Similarly, confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the arrow E direction until it stops. (Fig. B)



Reel Shift Gear Operation Confirmation

Adjustment after Replacement

11. Confirm the Cassette Pillar Height

Refer to section 5-16-2.

5-19. Reel Shift Motor Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 of section 5-16.)
2. Remove the SE-435 Board
3. Remove the Reel Shift Assembly
4. Remove the M Gear
5. Remove the Reel Shift Motor
6. Remove the CCM-15 Board
7. Mount the CCM-15 Board
8. Install the Reel Shift Motor
9. Install the M Gear
10. Install the Reel Shift Assembly
11. Smear Grease (Warm Gear)
12. Install the SE-435 Board
13. Install the RS Table Block Assembly (Refer to procedures 9 through 13 of section 5-16.)

Adjustment after Replacement

14. Confirm the Cassette Pillar Height (Refer to section 5-16-2.)
15. Confirm the Reel Shift Motor Operation
    (Refer to section 4-3-2. 2 in maintenance manual part 1.)
    (F 2 : REEL SHIFT MOTOR)

Notes

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L wrench (D = 0.89 mm) : 7-700-736-06
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver hexagonal bit (D = 0.89 mm, L = 50 mm) : J-6323-440-A
- Thickness gauge : 9-911-053-00
- Grease (SGL-601) : 7-651-000-10
- Oil : 7-661-018-18
- Screw-locking compound : 7-432-114-11
- Cleaning fluid : 9-919-573-01
- Cleaning cloth : 3-184-527-01

Removal

1. Remove the RS Table Block Assembly

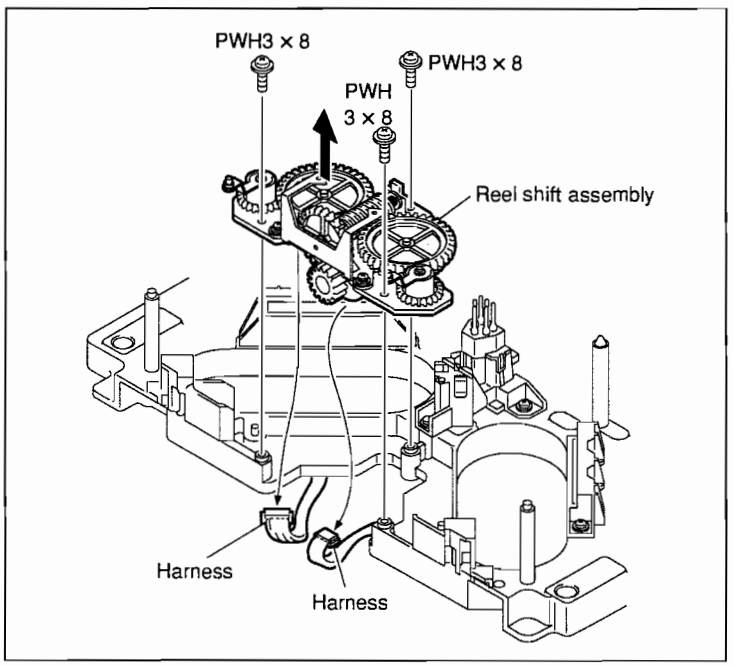
Remove the RS table block assembly on the supply and take-up sideswith the reel table assembly attached. (Refer to procedures 1 through 3 of section 5-16.)

2. Remove the SE-435 Board

Refer to procedure 2 of section 5-18.

3. Remove the Reel Shift Assembly

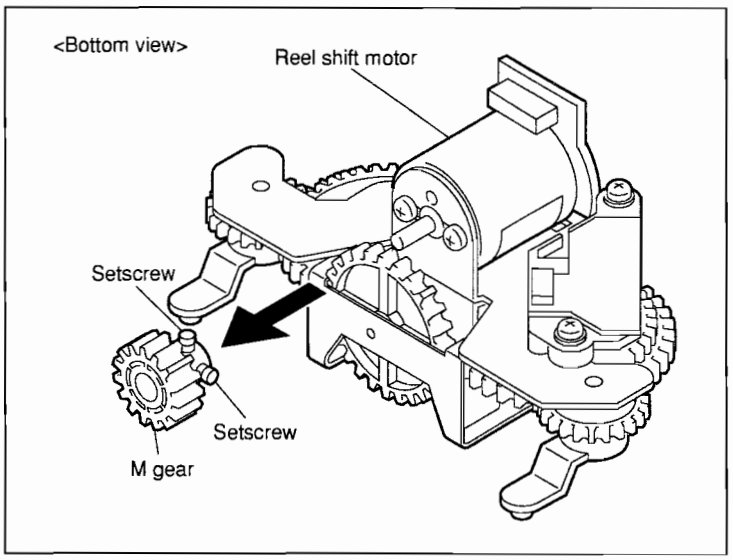
(1) Remove the three screws.
(2) Raise the reel shift assembly and disconnect the two harness shown in the figure.



Reel Shift Assembly Removal

4. Remove the M Gear

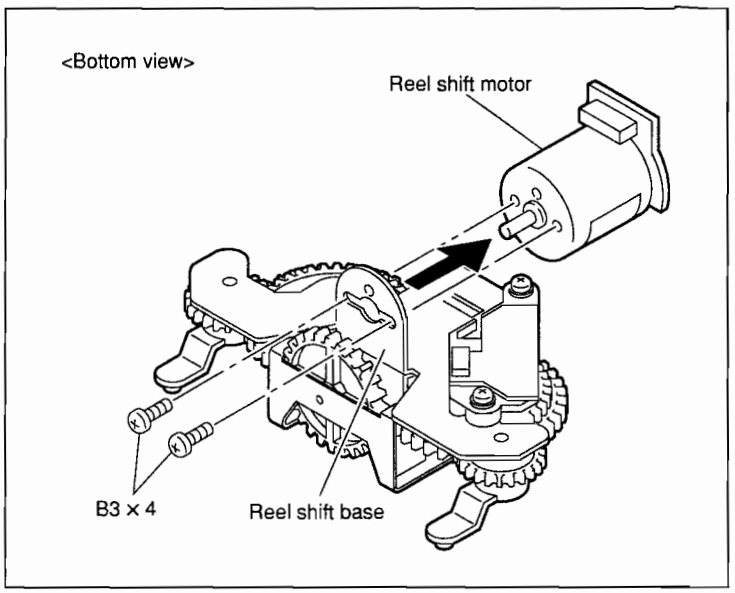
(1) Loosen the two setscrews shown in the figure.
(2) Pull out the M gear from the shaft.



M Gear Removal

5. Remove the Reel Shift Motor

Remove the two screws, then remove the reel shift motor from the reel shift base.



Reel Shift Motor Removal

6. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board from the reel shift motor.

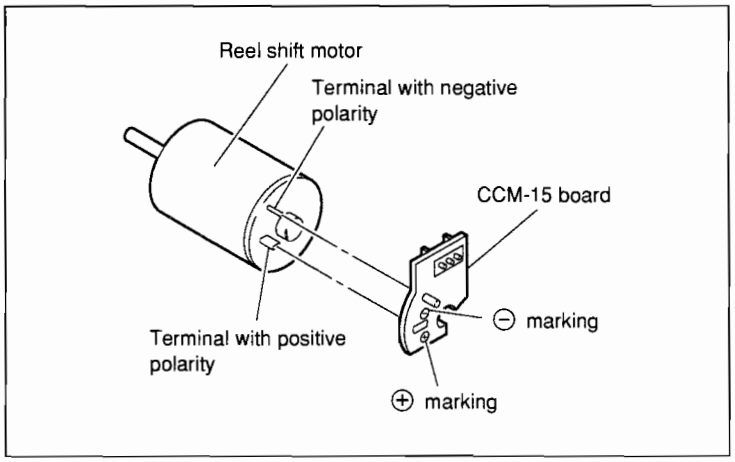
Installation

7. Mount the CCM-15 Board

Pass the terminals of a new motor through the CCM-15 board, then solder.

Note

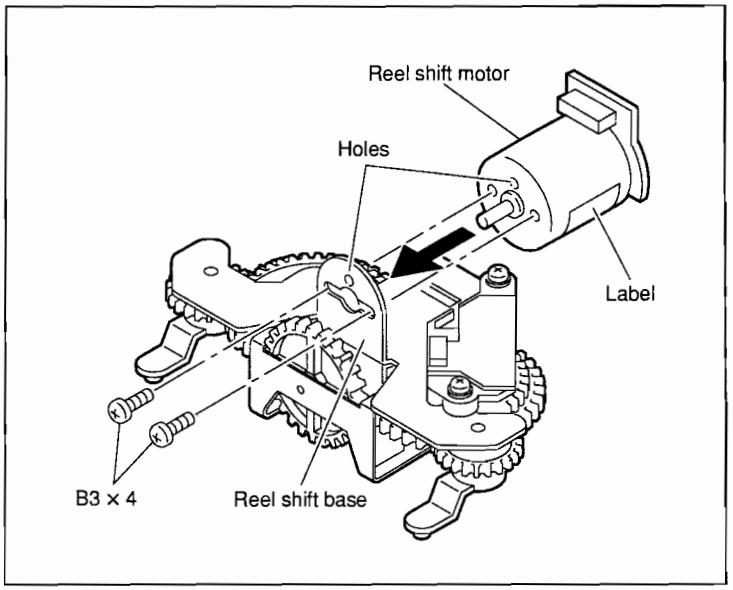
Solder so that no clearance exists between the motor and CM-15 board.



CCM-15 Board Removal/Mounting

8. Install the Reel Shift Motor

(1) Align the position of the reference hole of the motor with that of the reel shift base and tighten the two screws.
(2) Apply screw-locking compound slightly to the screws.



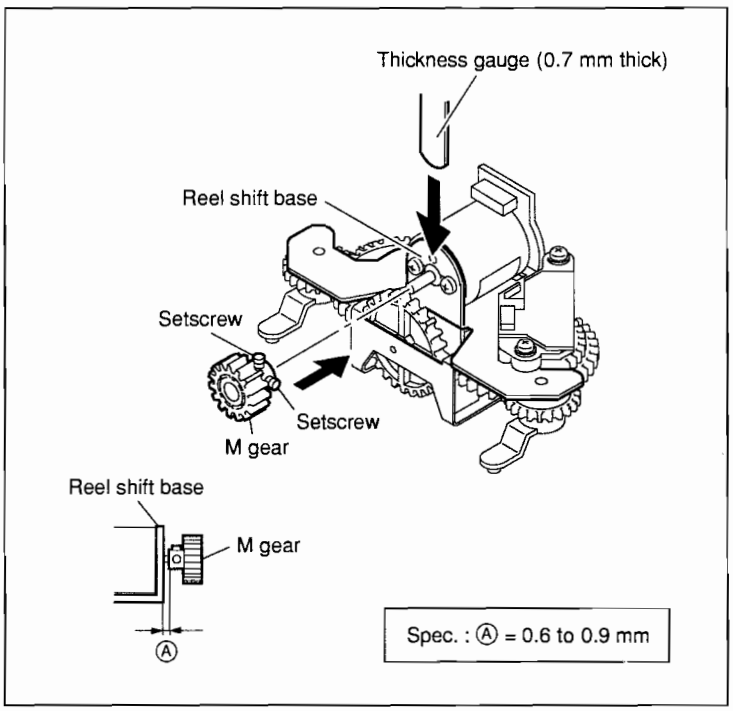
Reel Shift Motor Installation

9. Install the M Gear

(1) Pass the M gear through the shaft of the motor.
(2) Put a thickness gauge (0.7 mm thick) between the M gear and reel shift base.
(3) Tighten the two setscrews while pushing the M gear toward the reel shift base.

Tightening torque : 18.6×10^{-2} N•m (1.9 kgf•cm)

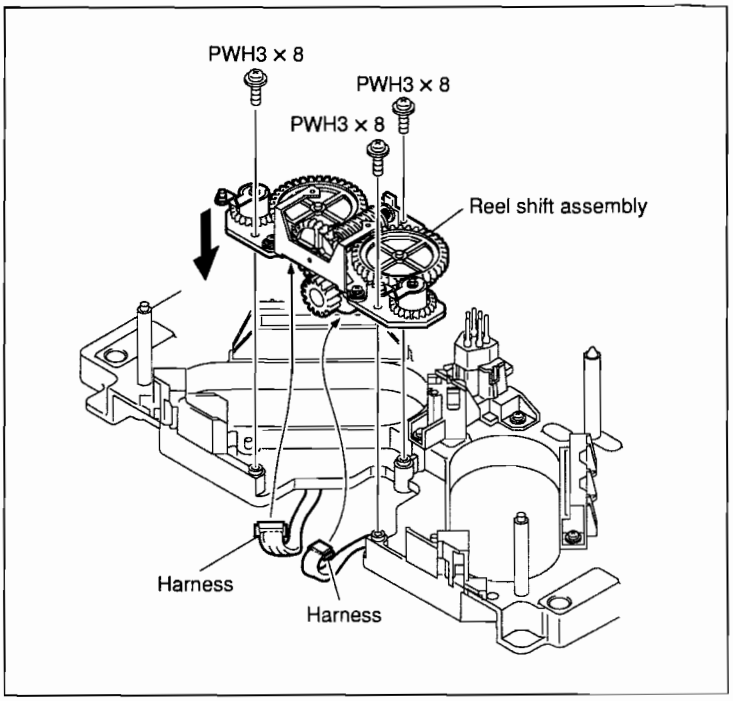
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the M gear and reel shift base meets the specification when the M gear is pushed toward the reel shift base.



M Gear Installation

10. Install the Reel Shift Assembly

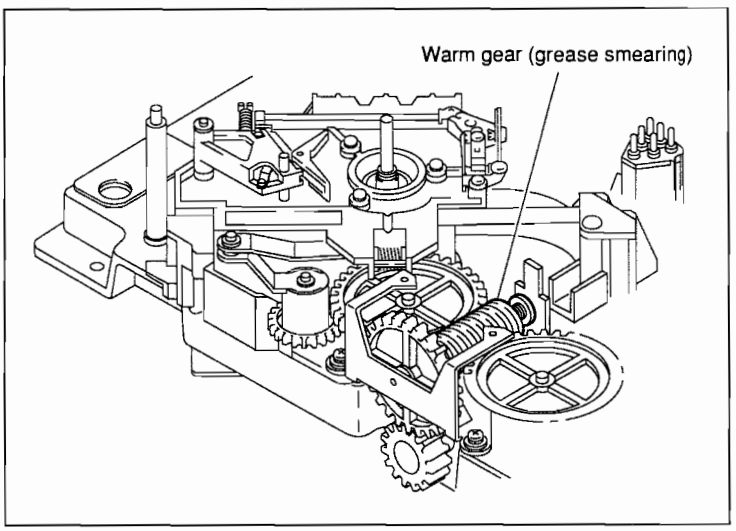
(1) Connect the two harness disconnected in procedure 2 to the reel shift assembly.
(2) Tighten the three screws.



Reel Shift Assembly Installation

11. Smear Grease

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.



Grease Smearing

12. Install the SE-435 Board

Refer to procedure 8 of section 5-18.

13. Install the RS Table Block Assembly

Refer to procedures 9 through 13 of section 5-16.

Adjustment after Replacement

14. Confirm the Cassette Pillar Height

Refer to section 5-16-2.

15. Confirm the Reel Shift Motor Operation

Refer to section 4-3-2. 2 in maintenance manual part 1.
(F 2 : REEL SHIFT MOTOR)

5-20. Tape Guide Replacement

Note

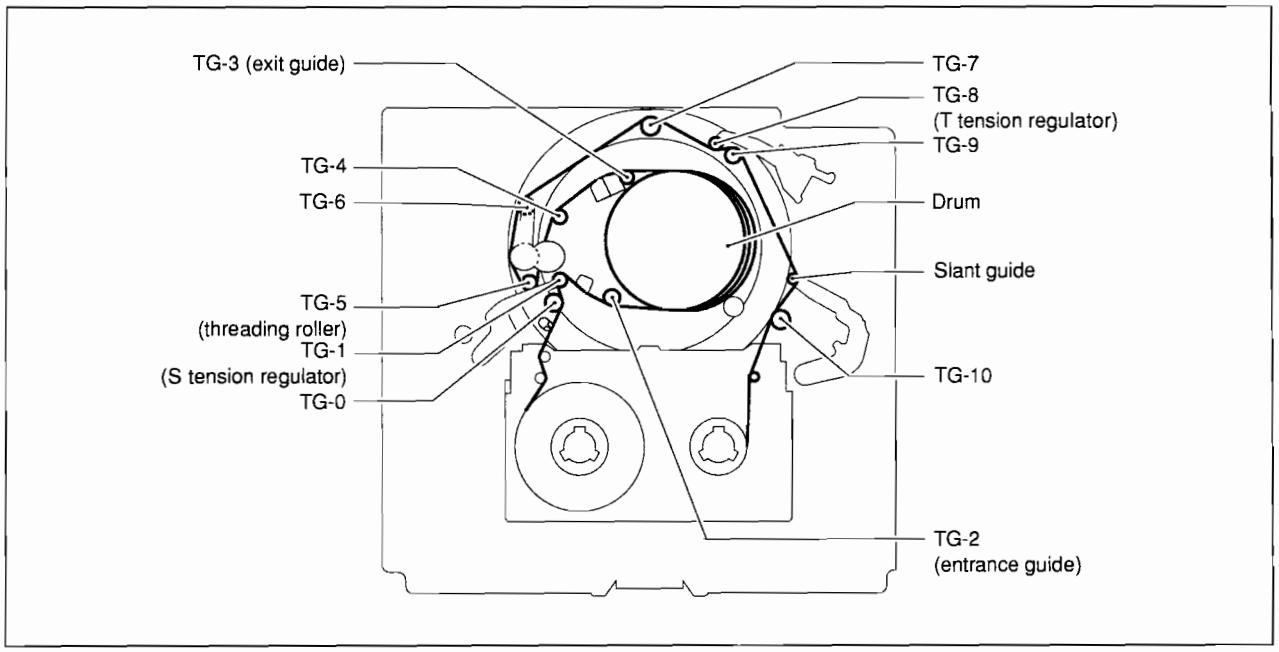
Be careful not to damage the drum when the tape guide roller is replaced.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to section 2-6 in maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part1.)

Replacement

Perform the part replacement while referring to the exploded view.



Adjustment after Replacement

- Perform the following adjustments when any tape guide is replaced.
  ① Tape running adjustment (Refer to section 6-1-2.)
  ② Video tracking confirmation (Refer to section 6-1-3.)
- Perform the following adjustments when the slant guide is replaced.
  ① Slant guide slantness adjustment (Refer to section 5-26-1.)
  ② Tape running adjustment (Refer to section 6-1-2.)
  ③ Video tracking confirmation (Refer to section 6-1-3.)
- Perform the following adjustments when the TG-2 or TG-3 is replaced.
  ① RF switching position adjustment
  (Refer to section 4-4-1. 2 in maintenance manual part 1.)
  (F 6 : RF SW AUTO)
  ② SAT operation check
  (Refer to section 4-3-3 of maintenance manual part 1.)
  (F 7 : FUNC MODE)

5-21. Tape Cleaner Replacement

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner. Never touch it with bare hands.

Outline

Replacement

1. Remove the Tape Cleaner
2. Install the Tape Cleaner

Note

The adjustment after tape cleaner replacement is not required.

Tools

- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver bit (+2 mm, L = 75 mm) : J-6323-420-A

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Removal

1. Remove the Tape Cleaner

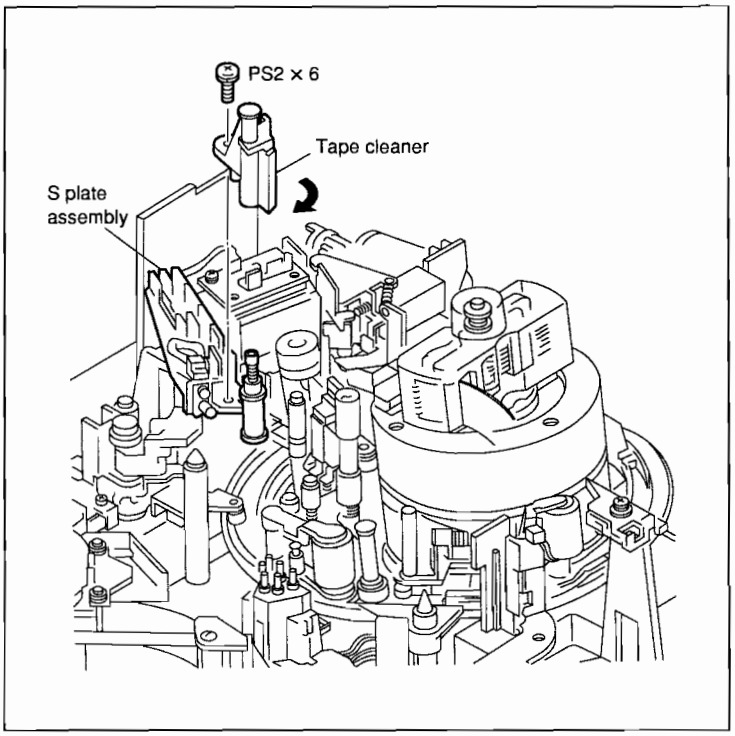
Remove the screw, then remove the tape cleaner from the S plate assembly.

Installation

2. Install the Tape Cleaner

Tighten the screw while moving a new tape cleaner clockwise.

Tightening torque : 19.6 × 10^{-2} N•m (20 kgf•cm)



Tape Cleaner Removal/Installation

5-22. Gear Box Assembly and Threading Motor Replacement

Outline

Replacement

1. Remove the plate MR
2. Disconnect the Connector
3. Remove the Gear Box Assembly
4. Remove the Threading Motor
5. Remove the CCM-15 Board
6. Mount the CCM-15 Board
7. Install the Threading Motor
8. Install the Gear Box Assembly
9. Install the plate MR

Adjustment after Replacement

10. Confirm the Threading Motor Operation
    (Refer to section 4-3-2. 1 in maintenance manual part 1.)
    ([F 7] : THREADING MOTOR)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual Part1.)
4. Remove the cassette compartment assemby.
   (Refer to section 2-7 in maintenance manual part1.)

Tools

- L wrench (D = 1.27 mm) : 7-700-736-01
- Screw-locking compound : 7-432-114-11
- Thickness gauge : 9-911-053-00

Removal

1. Remove the plate MR

(1) Remove the AT head harness from the harness clampers. Be very careful not to apply excessive force to the AT head.
(2) Remove the two screws and pull out the plate MR.

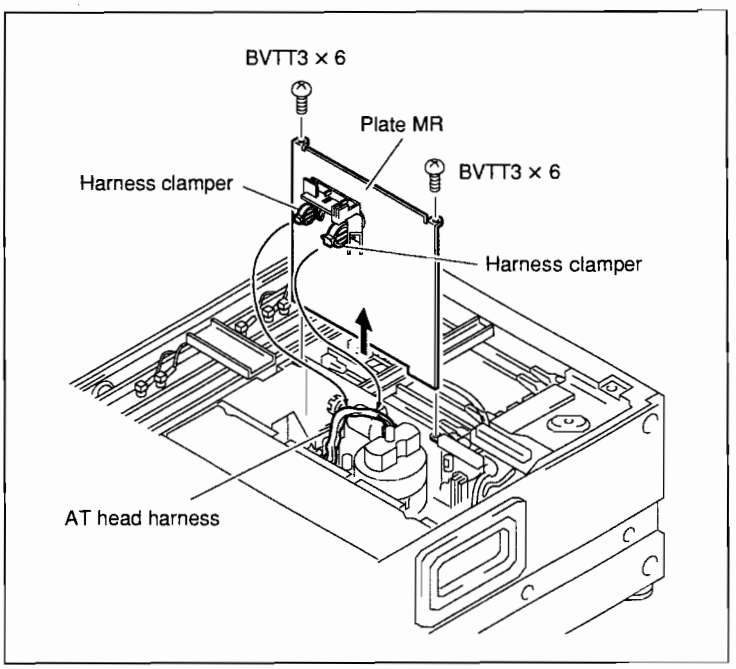


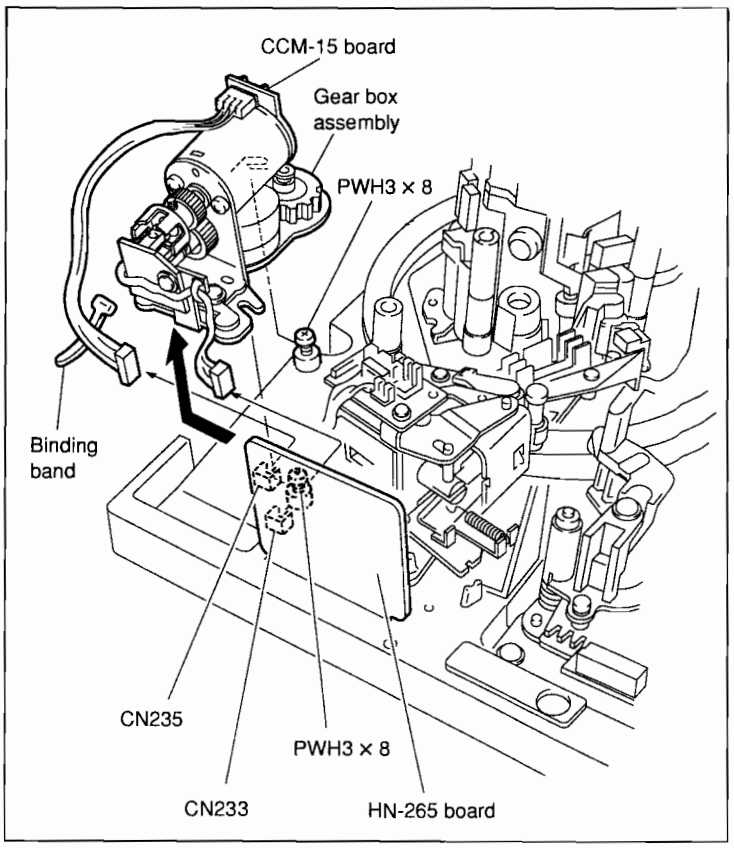
Plate MR Removal

2. Disconnect the Connector

Cut off the binding band, and disconnect CN235 and CN233 on the HN-265 board.

3. Remove the Gear Box Assembly

Loosen the two screws and remove the gear box assembly.



Gear Box Assembly Removal

4. Remove the Threading Motor

(1) Loosen the setscrew of the M gear.

(2) Remove the two screws fixing the motor.

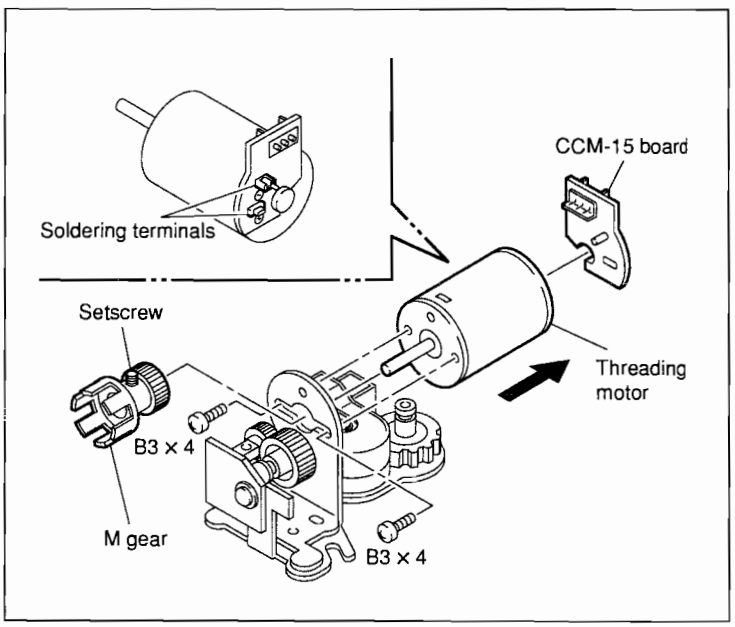
Note

Take care that the screwdriver does not strike against the M gear.

(3) Remove the threading motor. (The M gear can also be removed at the same time.)

5. Remove the CCM-15 Board

Unsolder the CCM-15 board and remove it from the threading motor.



Threading Motor Removal

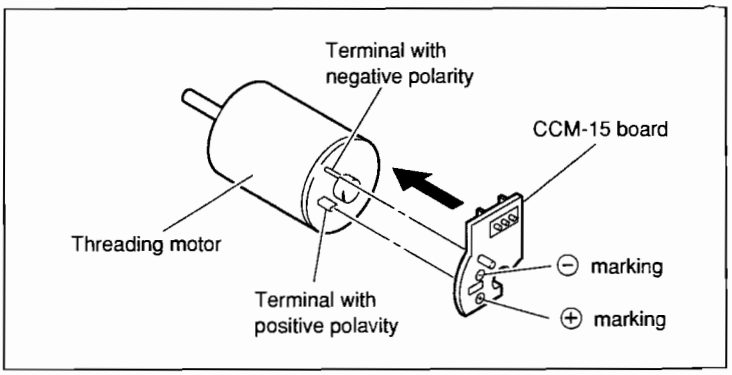
Installation

6. Mount the CCM-15 Board

Pass the pins of the threading motor through the CCM-15 board and solder them.

Note

Solder so that no clearance exists between the motor and CCM-15 board.



CCM-15 Board Mounting

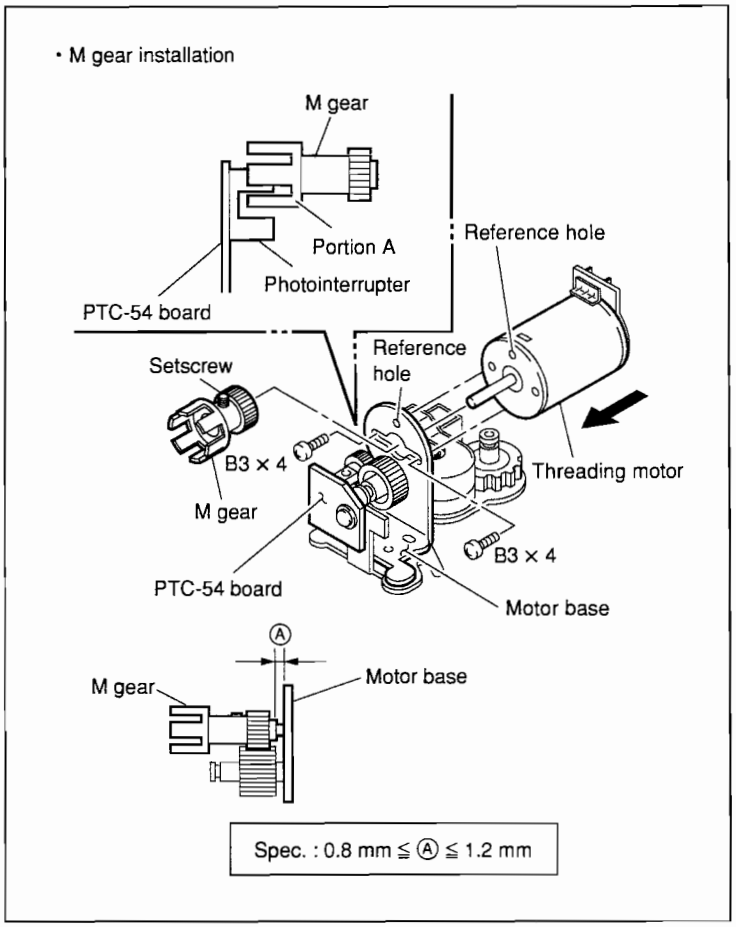
7. Install the Threading Motor

(1) Put portion A of the M gear into the photointerrupter on the PTC-54 board.
(2) Pass the motor shaft through the hole of the motor base and align the reference hole position of the motor with that of the motor base.
(3) Apply the screw-locking compound slightly to the motor fixing screws and tighten them.

Note

Take care that the screwdriver does not strike against the M gear.

(4) Put the thickness gauge (1.0 mm thick) between the M gear and motor base.
(5) Tighten the setscrew while pushing the M gear slightly toward the motor base.
(6) Pull out the thickness gauge.
(7) Confirm that the clearance between the M gear and motor base meets the specification when the M gear is pushed toward the motor base.
(8) Rotate the M gear manually and confirm that the M gear rotates smoothly. Moreover, confirm that the M gear does not touch the photointerrupter.



Threading Motor Installation

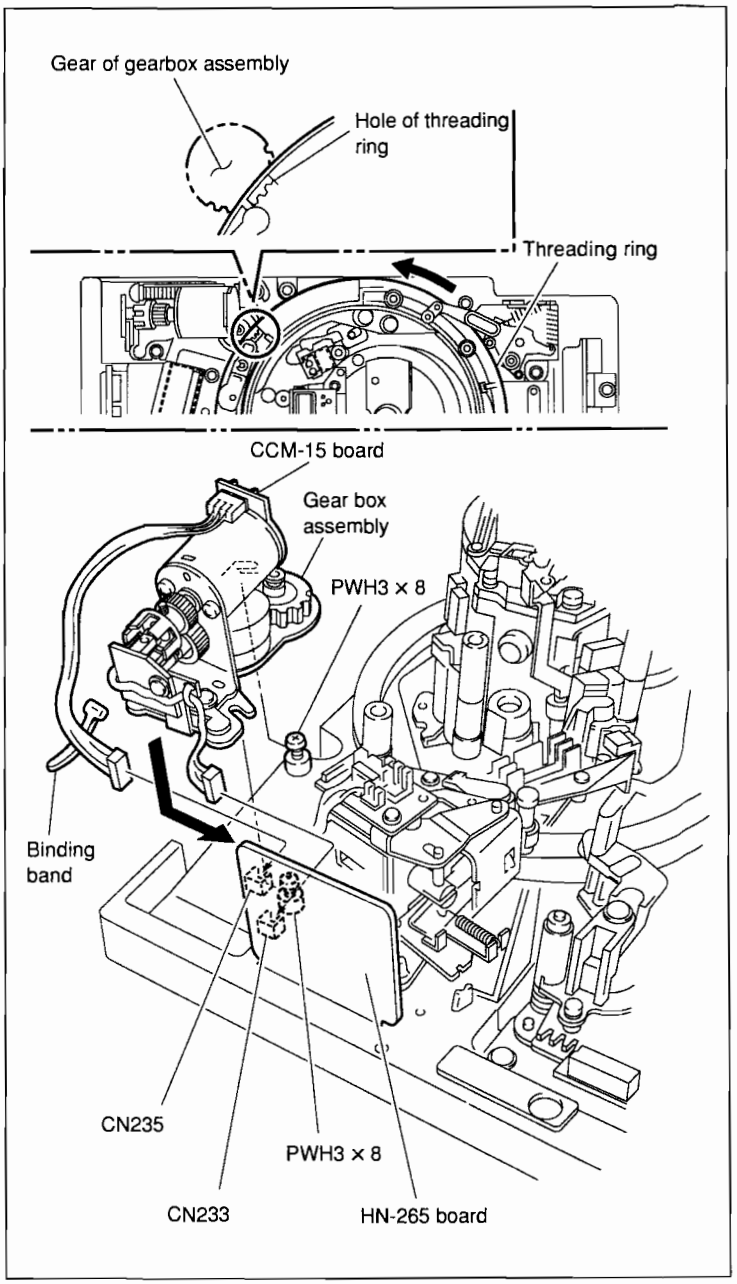
8. Install the Gear Box Assembly

(1) Rotate the threading ring so that the pinch roller places in front of the pinch solenoid.

Note

Move the hole of the threading ring to confirm the engagement of the gear when the gear box assembly is installed.

(2) Push the gear of the gear box assembly against that of the threading ring.
(3) Confirm from the hole of the threading ring that the gear of the gear box assembly engages with that of the threading ring.
(4) Tighten the screws while pushing the gear box assembly slightly toward the threading ring.
(5) Connect the two connectors to CN233 and CN235 on the HN-265 board.
(6) Bind the harnesses using the binding bands (or the equivalent).



Gear Box Assembly Installation

9. Install the Plate MR

(1) Insert the plate MR. At this time, be careful not to push the AT head harness by the clampers.
(2) Tighten the two screws in the order indicated by the figure.
(3) Fasten the AT head harness with the two clampers. At this time, be careful not to apply excessive force to the AT head.

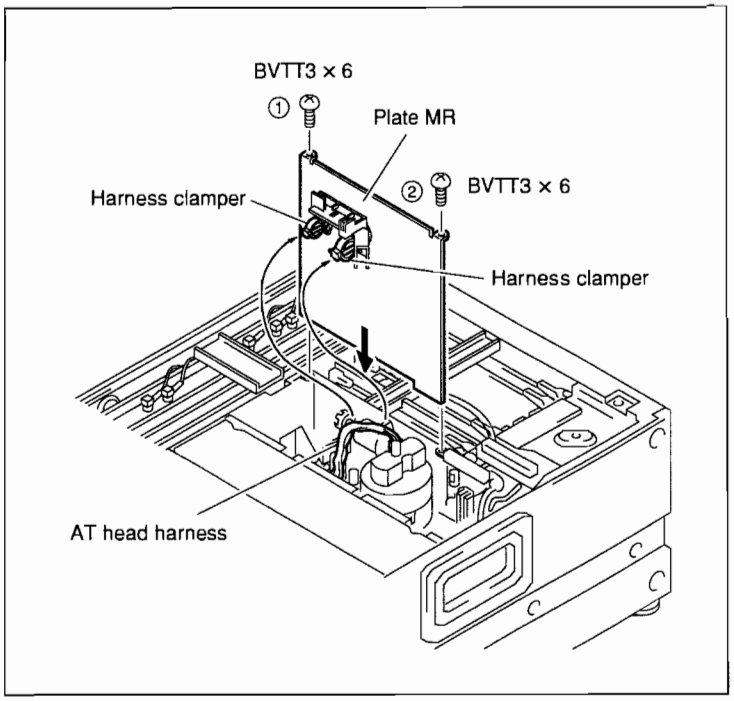


Plate MR Installation

Adjustment after Replacement

10. Confirm the Threading Motor Operation

Refer to section 4-3-2. 1 in maintenance manual part 1.
([F 7] : THREADING MOTOR)

5-23. Threading Ring Assembly and Ring Roller Replacement

Outline

Replacement

1. Remove the Upper Drum Cover Assembly
2. Remove the Flexible Board (CN241/HN-266 Board)
3. Disconnect the Harness (AT Head Board)
4. Remove the Pinch Arm Guard
5. Remove the CL Guide Rail
6. Remove the Pinch Press Assembly
7. Remove the S Plate Assembly
8. Remove the S Tension Regulator Assembly
9. Remove the T Drawer Assembly
10. Remove the Gear Box Assembly (Refer to procedures 1 through 3 of section 5-22.)
11. Remove the Ring Roller
12. Remove the Threading Ring Assembly
13. Install the Ring Roller (C)
14. Cleaning (Threading Ring Assembly)
15. Install the Threading Ring Assembly
16. Install the Ring Roller
17. Install the Gear Box Assembly (Refer to procedure 8 of section 5-22.)
18. Confirm the Threading Ring Operation
19. Install the S Plate Assembly
20. Install the Pinch Press Assembly
21. Put the Unit in the Unthreading End State
22. Install the S Tension Regulator Assembly
23. Install the T Drawer Assembly
24. Confirm the T Drawer Assembly Operation
25. Install the CL Guide Rail
26. Confirm the CL Arm Assembly Operation
27. Install the Pinch Arm Guard
28. Connect the Flexible Board (CN241/HN-266 Board)
29. Connect the Harness (AT Head Board)
30. Install the Upper Drum Cover Assembly
31. Adjust the Pinch Press Clearance (Refer to section 5-12-1.)
32. Confirm the Tape Running (Refer to section 6-1-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD. (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

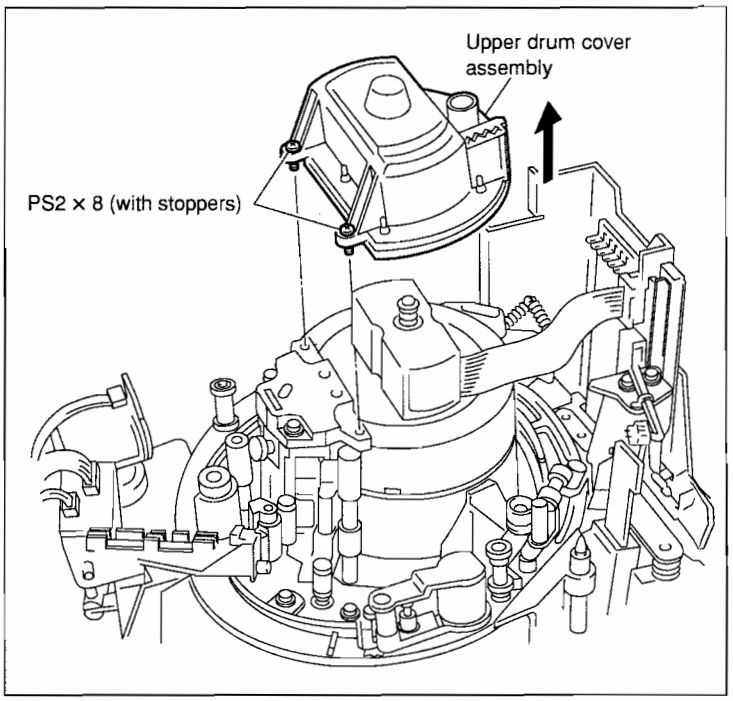
Removal

1. Remove the Upper Drum Cover Assembly

Loosen the two screws and remove the upper drum cover assembly.

Note

These screws cannot be removed because of stoppers.



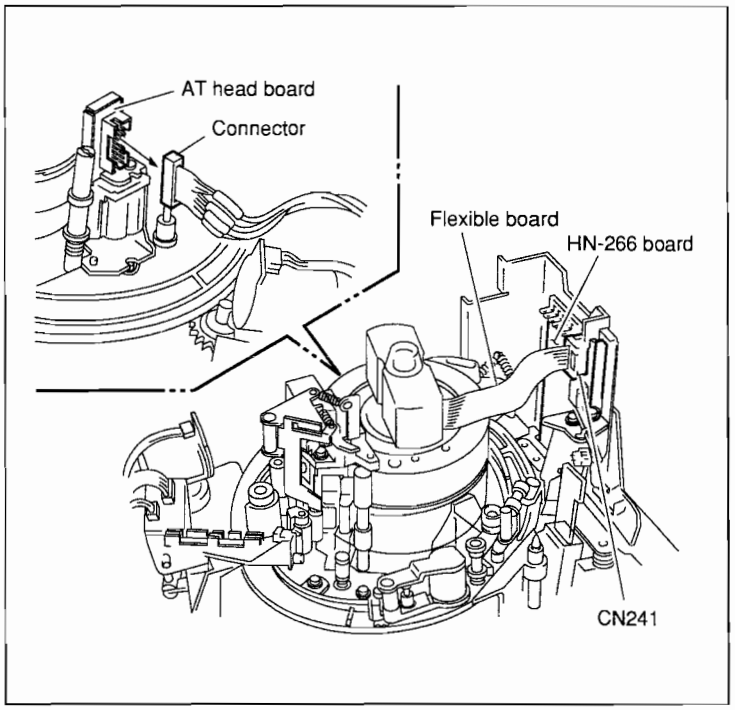
Upper Drum Cover Assembly Removal

2. Remove the Flexible Board

Disconnec the flexible board from the coonnector CN241 on the HN-266 board.

3. Disconnect the Harness

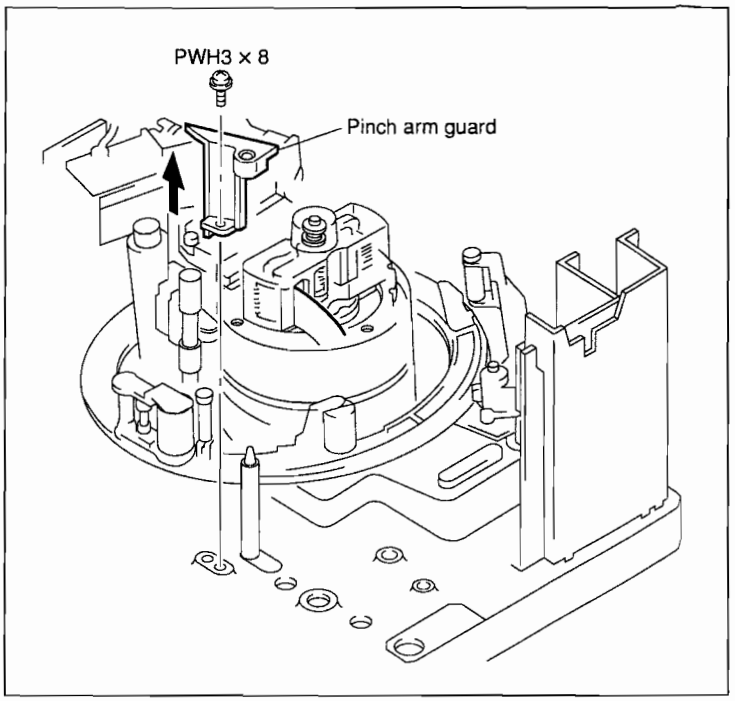
Disconnect the harness from the connector on the AT head board.



Flexible Board and Harness Removal

4. Remove the Pinch Arm Guard

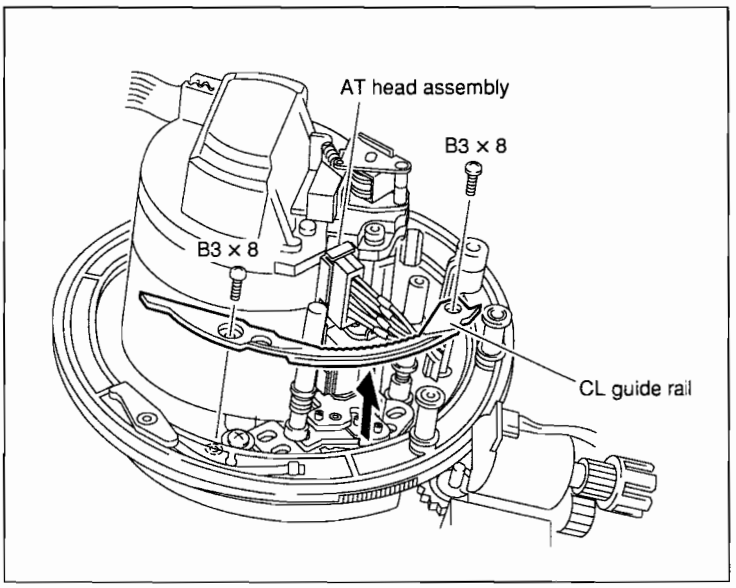
Remove the screws, and remove the pinch arm guard.



Pinch Arm Guard Removal

5. Remove the CL Guide Rail

Remove the two screws, and remove the CL guide rail.

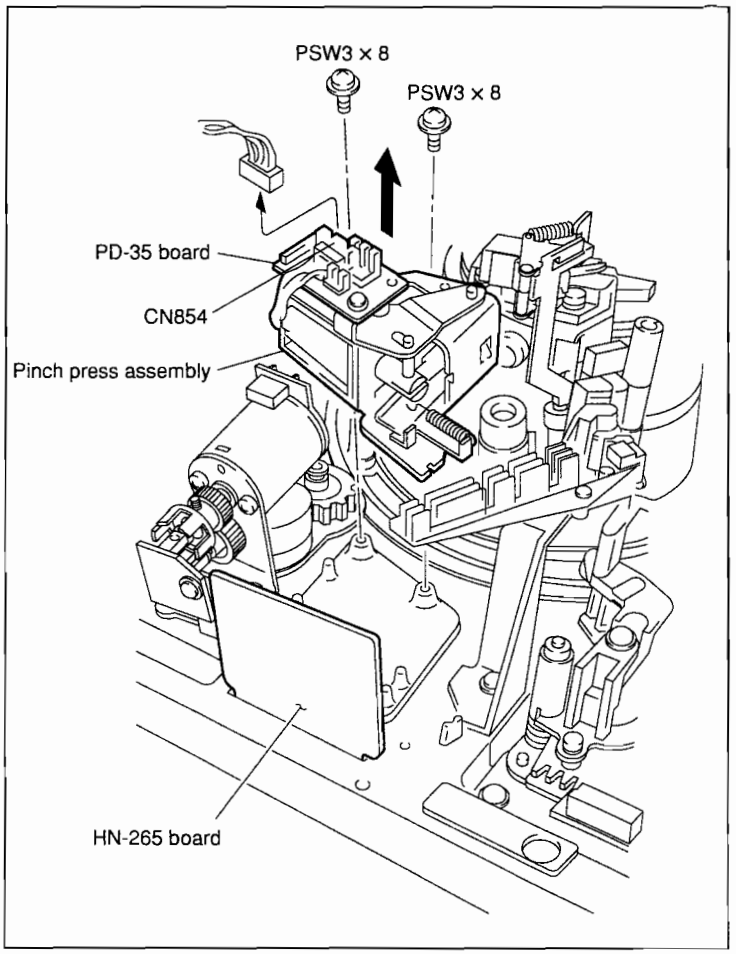


CL Guide Rail Removal

6. Remove the Pinch Press Assembly

(1) Disconnect the harness from the connector CN854 on the PD-35 board.

(2) Remove the two screws, and remove the pinch press assembly.



Pinch Press Assembly Removal

7. Remove the S Plate Assembly

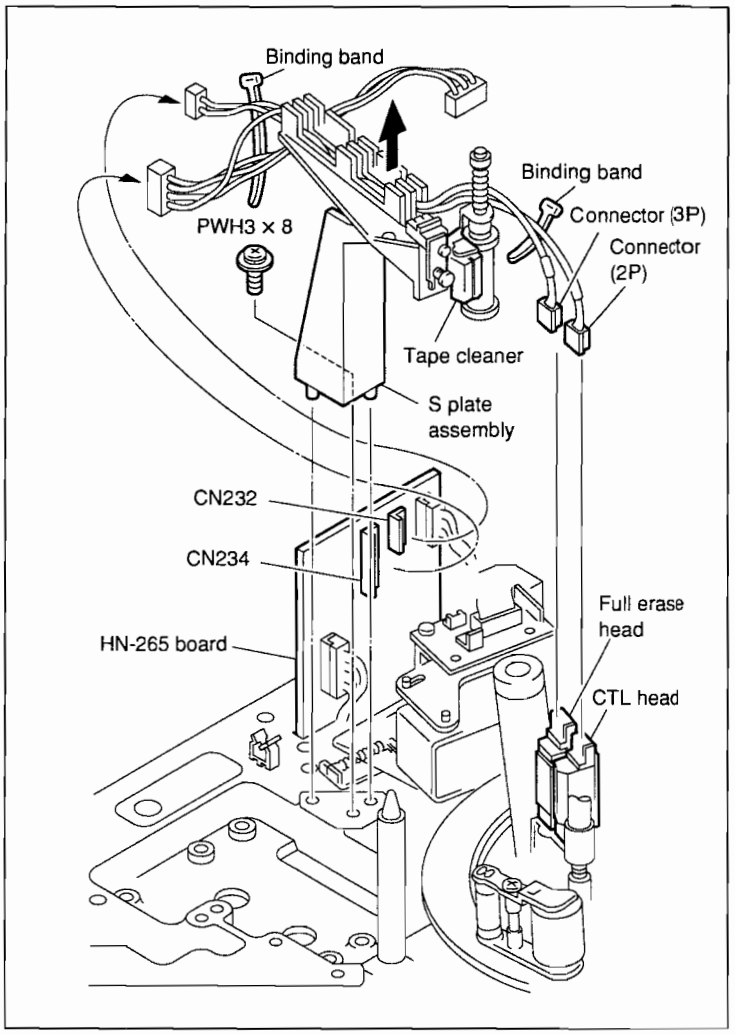
(1) Remove the binding band and disconnect the harness from the connectors CN232 and CN234 on the HN-265 board.

(2) Remove the binding band and disconnect the harness from the connectors on the CTL head board and the full-erase head board.

(3) Remove the screw, and remove the S plate assembly.

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.



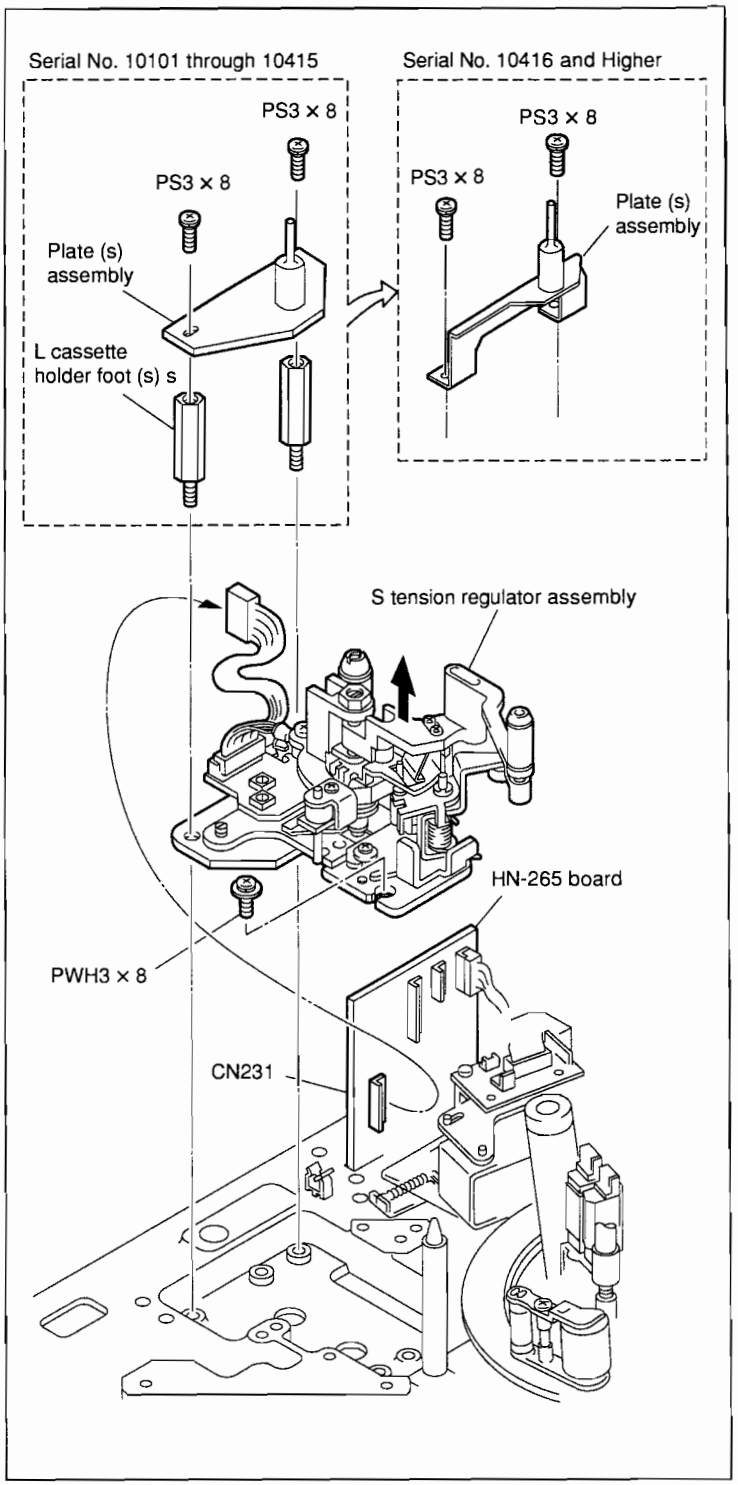
S Plate Assembly Removal

8. Remove the S Tension Regulator Assembly

(1) Disconnect the harness from the connector CN231 on the HN-265 board.

(2) Remove the two L screws, then remove the plate (s) assembly.

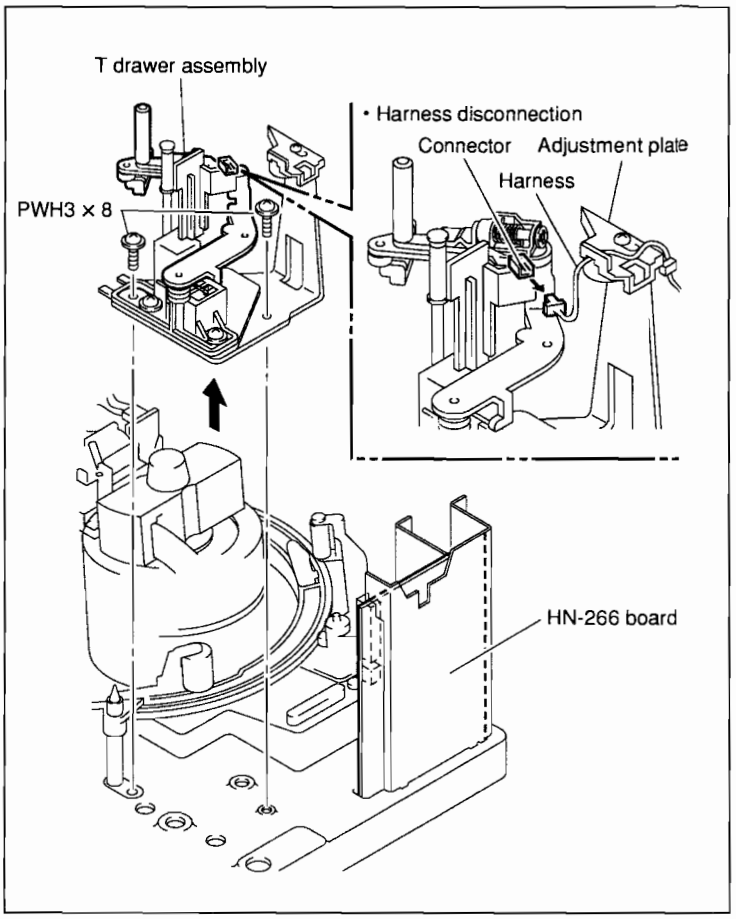
(3) **Serial No. 10101 through 10415**
Remove the two L cassette holder foot (s) and a screw, then remove the S tension regulator assembly.
Serial No. 10416 and Higher
Remove a screw, then remove the S tension regulator assembly.



S Tension Regulator Assembly Removal

9. Remove the T Drawer Assembly

(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the harness from the holder of adjustment plate.
(3) Remove the two screws, and remove the T drawer assembly.



T Drawer Assembly Removal

10. Remove the Gear Box Assembly

Refer to procedures 1 through 3 of section 5-22.

11. Remove the Ring Roller

(1) Remove the screws, and remove the ring rollers (A) and (B).

Note

Be careful not to touch the drum (especially, video heads).

(2) Move the threading ring in the arrow direction.

(3) Remove the screw, and remove the ring roller (C).

Note

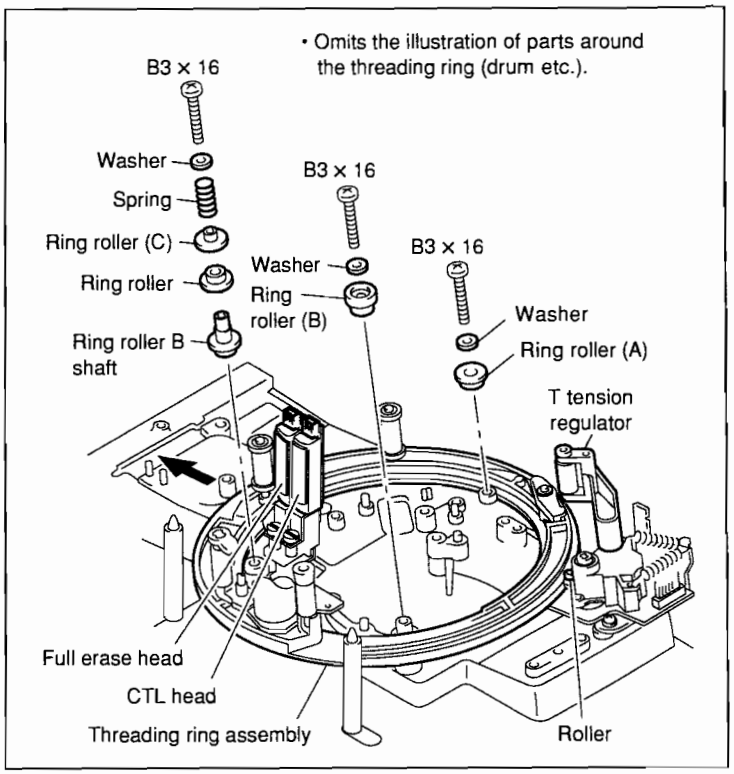
Be careful not to damage the CTL head or full-erase head.

12. Remove the Threading Ring Assembly

Remove the threading ring assembly from the chassis.

Note

Be careful not to damage the drum (especially, video heads or upper drum's tape running surface) and capstan motor shaft.



Ring Roller (C) Removal/Installation

Installation

13. Install the Ring Roller (C)

(1) Assemble parts in the order shown in the figure of procedure 11 and install the ring roller (C) in the chassis.

Note

Be careful not to damage the CTL head or full-erase head.

14. Cleaning

Clean the inside of a new threading ring assembly with cleaning cloth moistened with cleaning fluid.

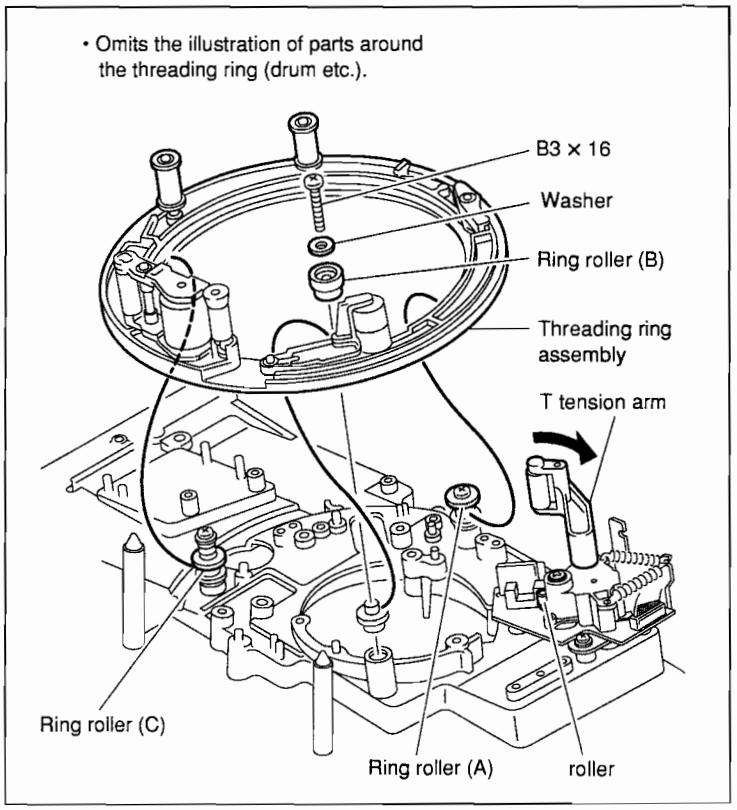
15. Install the Threading Ring Assembly

Push the T tension arm in the arrow direction and install the threading ring assembly while putting it in the grooves of the ring rollers (A) and (C).

16. Install the Ring Roller

(1) Pass the ring roller (B) through the roller shaft and tighten the screw while holding the threading ring assembly so that it is not dislocated from the grooves of the ring rollers (A) and (C).

(2) Confirm that the threading ring assembly is put between the three ring rollers. Moreover, confirm that the T tension regulator roller is not dislocated from the side of the threading ring.



Threading Ring Assembly Installation

17. Install the Gear Box Assembly

Refer to procedure 8 of section 5-22.

18. Confirm theThreading Ring Operation

Turn the M gear of the gear box assembly for threading and unthreading directions, and confirm that the threading ring and three ring rollers rotate smoothly.

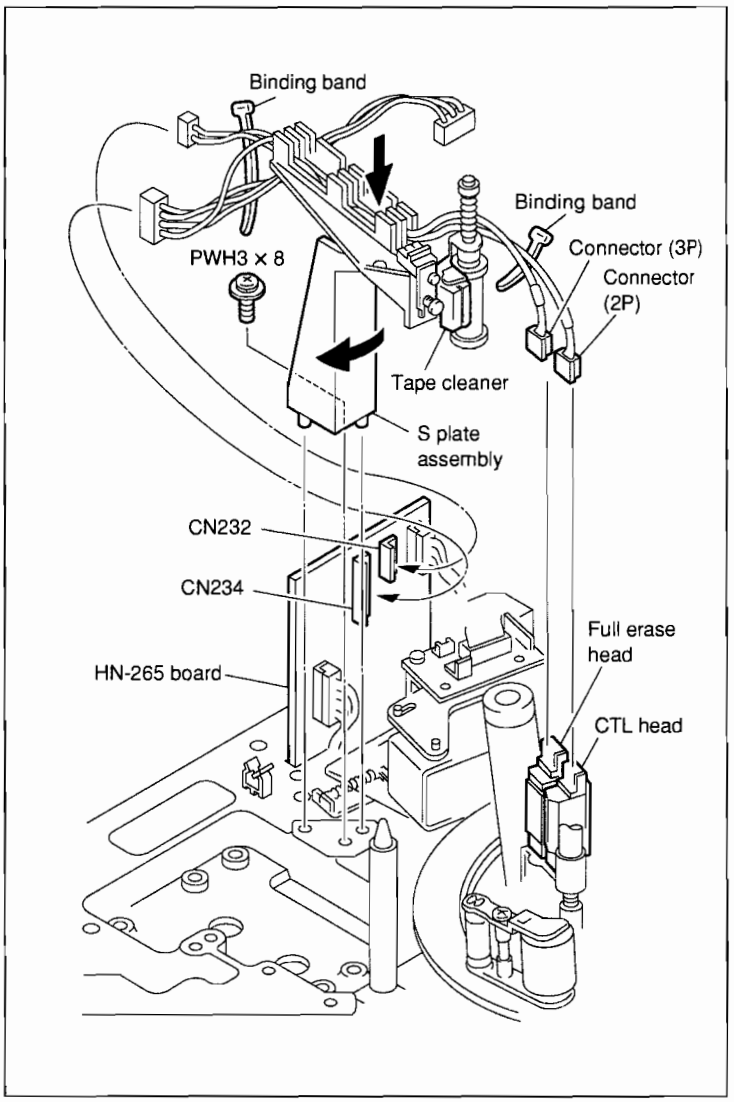
19. Install the S Plate Assembly

(1) Insert the pins of the S plate assembly into the holes of the chassis and tighten the screw while moving the S plate assembly clockwise.

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

(2) Connect the harness to the connectors CN232 and CN234 on the HN-265 board.
(3) Fix the harness using a binding band (or the equivalent).
(4) Connect the harness to the connectors on the CTL head board and full-erase head board.
(5) Fix the harness using a binding band (or the equivalent).

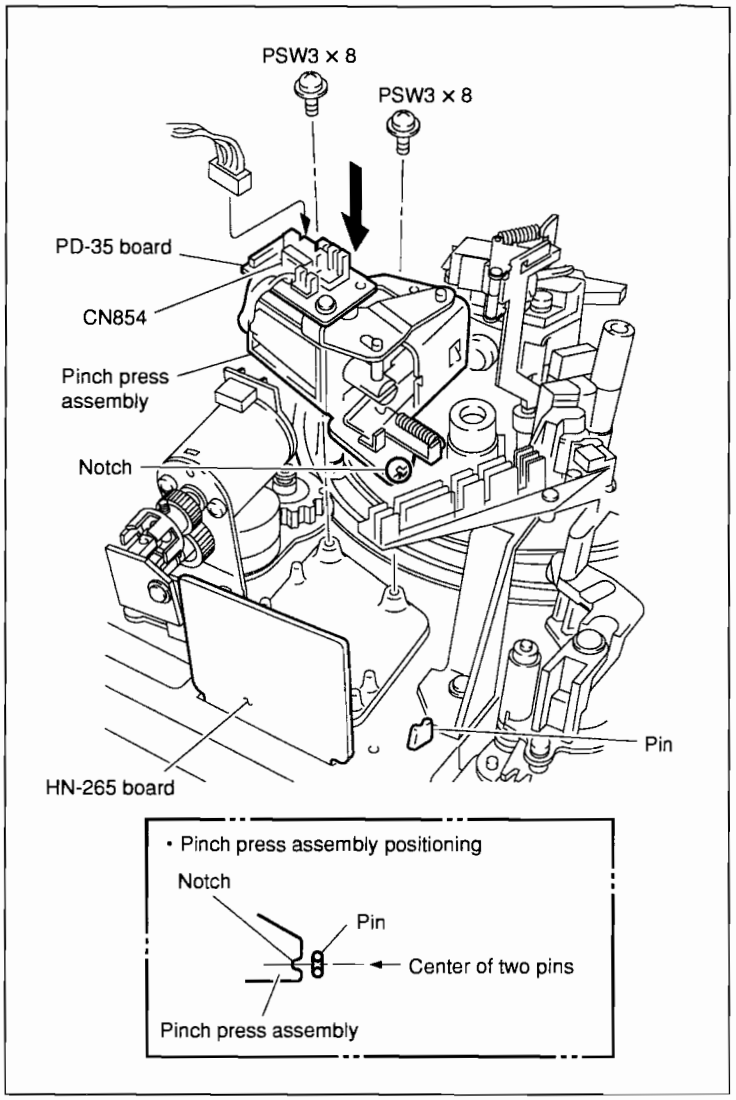


S Plate Assembly Installation

20. Install the Pinch Press Assembly

(1) Align the notch of the pinch press assembly with the center of the pin of the chassis, and tighten the two screws.

(2) Connect the harness to the connector CN854 on the PD-35 board.



Pinch Press Assembly Installation

21. Put the Unit into the Unthreading End State.

22. Install the S Tension Regulator Assembly

(1) Clean the installation surfaces of the S tension regulator assembly and chassis in the three portions.

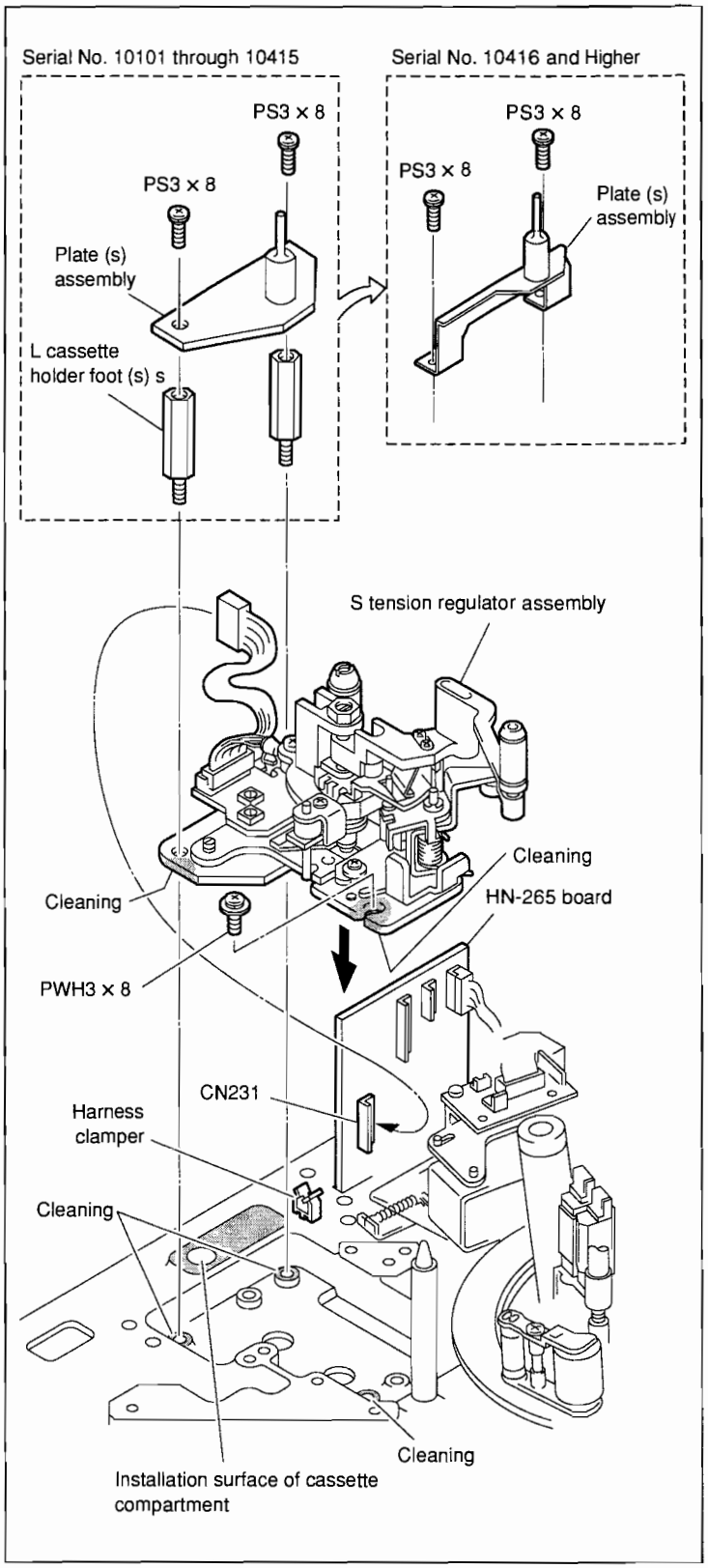
(2) **Serial No. 10101 through 10415**
Set the S tension regulator assembly, then tighten with the two L cassette holder foot (s) and a screw.
Serial No. 10416 and Higher
Set the S tension regulator assembly, then tighten a screw.

(3) Install the plate (s) assembly with the two screws.

(4) Connect the harness into the connector CN231 on the HN-265 board.

(5) Put the harness in the harness clamper.

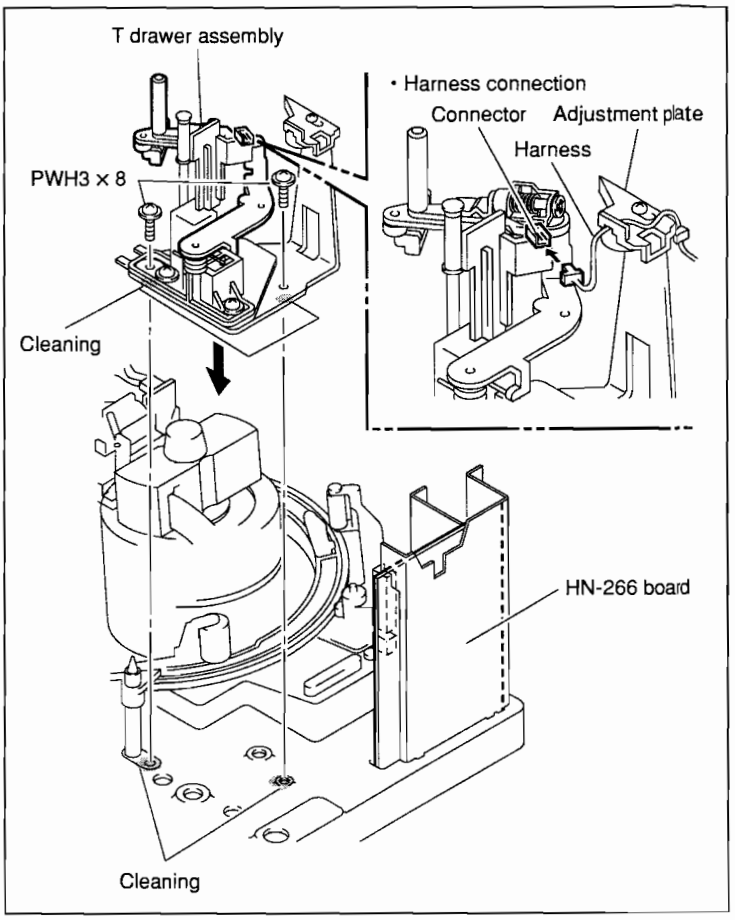
(6) Confirm that the harness does not protrude into the installation surface (▒ portion in the figure) of the cassette compartment.



S Tension Regulator Assembly Installation

23. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



T Drawer Assembly Installation

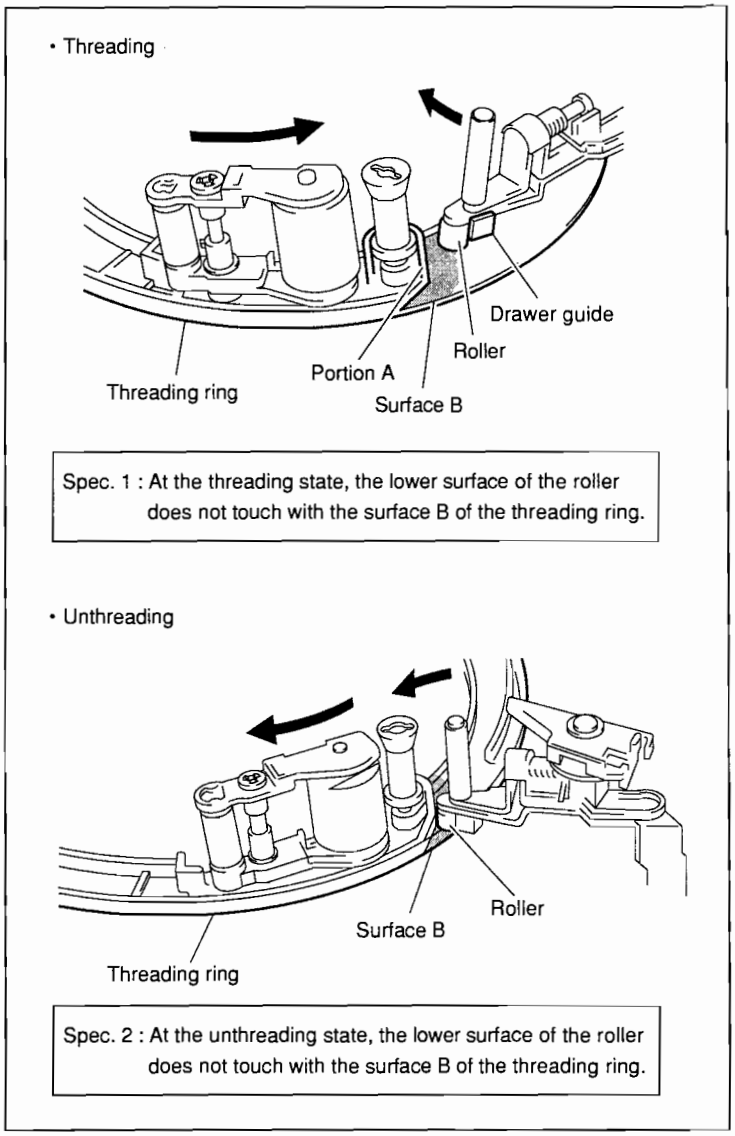
24. Confirm the T Drawer Assembly Operation

(1) Confirm that portion A of the threading ring is pushing the roller and drawer guide of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (▒ portion in the figure) of the threading ring at that time. (Specification 1)

If specification 1 is not met, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 of section 5-26.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (▒ portion in the figure) of the threading ring at that time. (Specification 2)

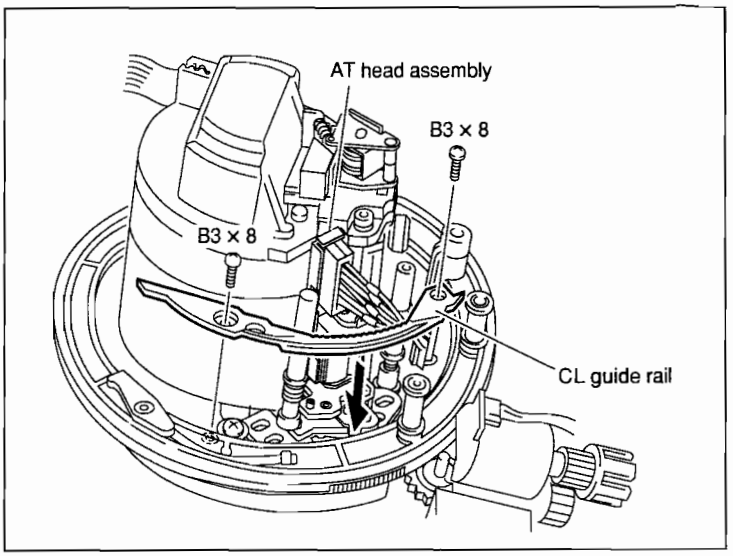
If specification 2 is not met, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 of section 5-26.)


• Threading
Drawer guide
Roller
Portion A
Threading ring
Surface B
Spec. 1 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.
• Unthreading
Roller
Surface B
Threading ring
Spec. 2 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

T Drawer Assembly Operation Confirmation

25. Install the CL Guide Rail

Install the CL guide rail with two screws.

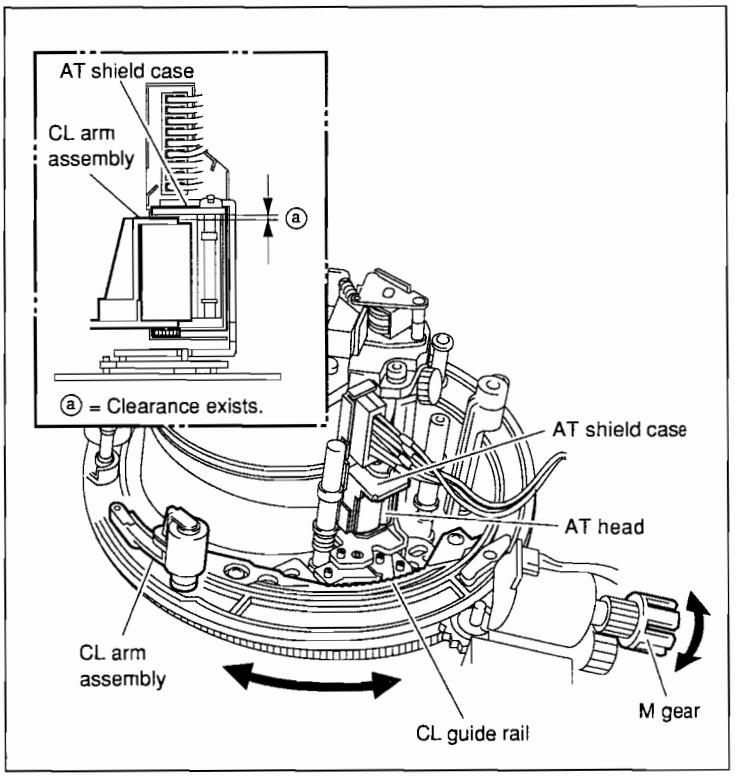


CL Guide Rail Installation

26. Confirm the CL Arm Assembly Operation

Turn the M gear of the gear box assembly and confirm the following items while repeating the threading and unthreading.

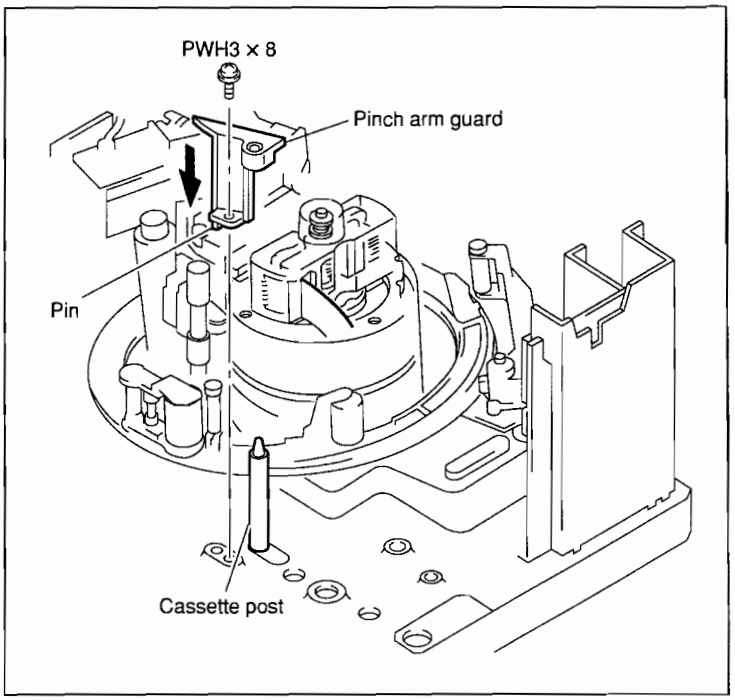
- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the top of the CL arm assembly and the AT shield case when the cleaning roller cleans the AT head.



CL Arm Assembly Operation Confirmation

27. Install the Pinch Arm Guard

(1) Pass the pinch arm guard through the cassette post and put the pin into the chassis hole.
(2) Tighten the screw.



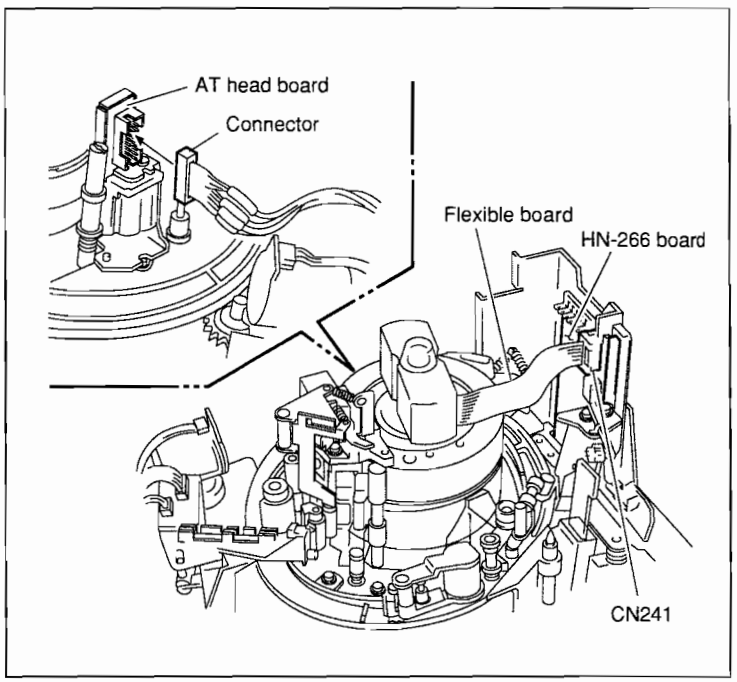
Pinch Arm Guard Installation

28. Connect the Flexible Board

Connect the flexible board to connector CN241 on the HN-266 board, then lock.

29. Connect the Harness

Connect the harness to the connector of the AT head board.



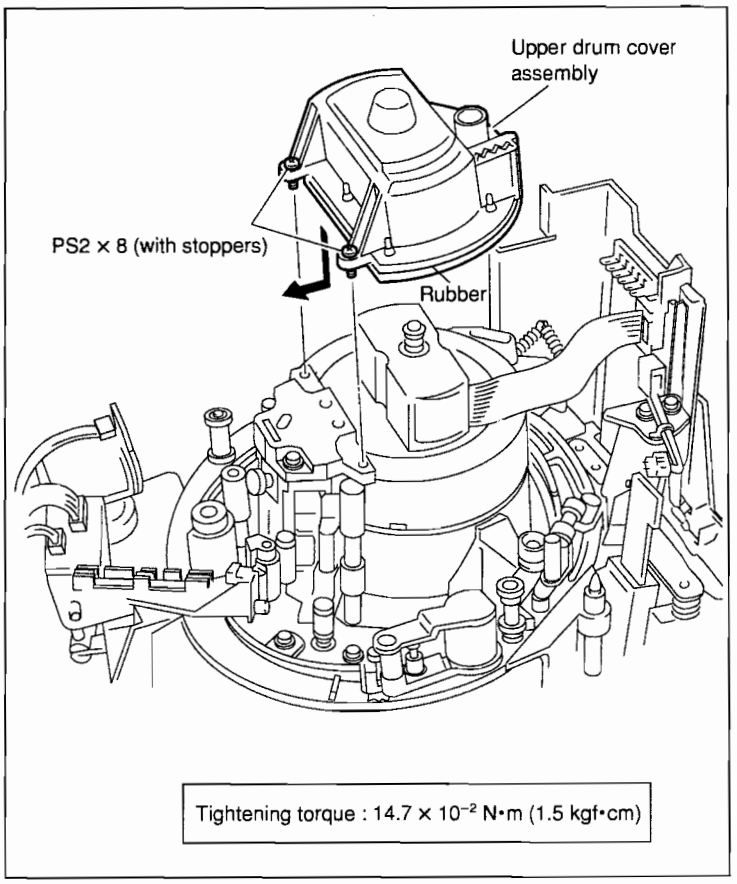
Flexible Board and Harness Connection

30. Install the Upper Drum Cover Assembly

(1) Tighten the two screws while pushing the upper drum cover assembly toward the height determining plate.

Tightening torque : 14.7×10^{-2} N•m (1.5 kgf•cm)

(2) Confirm that the rubber of the upper drum cover assembly does not turn over.
(3) Confirm that the no clearance between the upper drum cover assembly and the upper drum.



Upper Drum Cover Installation

Adjustment after Replacement

31. Adjust the Pinch Press Clearance

Refer to section 5-12-1.

32. Confirm the Tape Running

Refer to section 6-1-2.

5-24. S Tension Regulator Assembly Replacement

Outline

Replacement

1. Put the Unit into the Unthreading End State
2. Remove the S Tension Regulator Assembly
3. Install the S Tension Regulator Assembly

Adjustment after Replacement

4. Adjust the Tape Running (Refer to section 6-1-2.)
5. Adjust the Tension Offset
   (Refer to section 4-4-1. 2 in maintenance manual part 1.)
   ([F 3] : TENSION OFFSET)
6. Save the Adjusted Data
   (Refer to section 4-4-1. 2 in maintenance manual part 1.)
   ([F 1] : NVRAM CONTROL)
7. Adjust the RF Switching Position
   (Refer to section 4-4-1. 2 in maintenance manual part 1.)
   ([F 6] : RF SW AUTO)
8. Confirm the SAT Operation
   (Refer to section 4-3-3 in maintenance manual part 1.)
   ([F 7] : FUNC MODE)

Note

The replacement of the component part on the S tension regulator assembly requires a precise adjustment. Therefore, replace the whole assembly (A-8267-795-E).

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Put the Unit into the Unthreading End State

2. Remove the S Tension Regulator Assembly

(1) Disconnect the connector CN231 on the HN-265 board.
(2) Remove the two screws, then remove the plate (s) assembly.
(3) **Serial No. 10101 through 10415**
Remove the two L cassette holder foot (s) and a screw, then remove the S tension regulator assembly.
Serial No. 10416 and Higher
Remove a screw, then remove the S tension regulator assembly.

Installation

3. Install the S Tension Regulator Assembly

(1) Clean the installation surface of the S tension regulator assembly and chassis in three portions.
(2) Set the S tension regulator assembly, then tighten the two L cassette folder foot (s) s and a screw.
(3) Install the plate (s) assembly with the two screws.
(4) Connect the connector to CN231 on the HN-265 board.
(5) Put the harness in the harness clamper.
(6) Confirm that the harness does not protrude into the installation surface (▒ portion in the figure) of the cassette compartment.

Adjustment after Replacement

4. Adjust the Tape Running

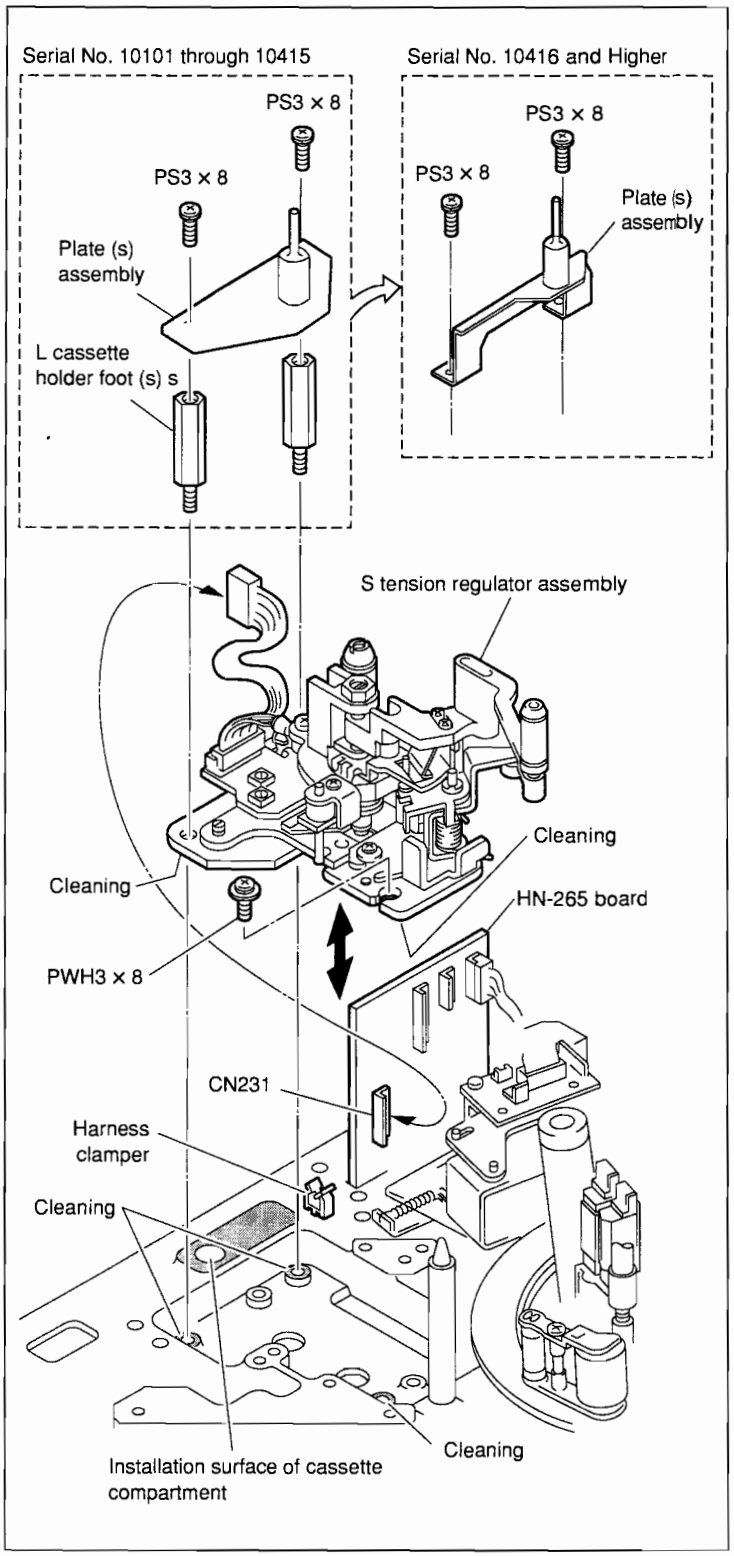
Refer to section 6-1-2.

5. Adjust the Tension Offset

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 3] : TENSION OFFSET)

6. Save the Adjusted Data

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 1] : NVRAM CONTROL)



S Tension Regulator Assembly Removal/Installation

7. Adjust the RF Switching Position

Refer to section 4-4-1. 2 in maintenance manual part 1.
([F 6] : RF SW AUTO)

8. Confirm the SAT Operation

Refer to section 4-3-3 in maintenance manual part 1.
([F 7] : FUNC MODE)

5-25. T Tension Arm Replacement

Outline

Replacement

1. Remove the Tension Spring (on the T Tension Base Side)
2. Remove the T Tension Arm
3. Remove theYoke Plate
4. Install the Yoke Plate
5. Install the T Tension Arm
6. Install the Tension Spring (on the T Tension Base Side)
7. Confirm the T Tension Regulator Operation

Adjustment after Replacement

8. Adjust the Tension Offset (Refer to section 4-4-1. 2 in maintenance manual part 1.)
   ([F 3] : TENSION OFFSET)
9. Save the Adjusted Data (Refer to section 4-4-1. 2 in maintenance manual part 1.)
   ([F 1] : NVRAM CONTROL)

Notes

- This section explains the replacement procedures of the T tension arm.
  When replacing whole of the T tension assembly, refer to exploded views of the maintenance manual part 2 volume 2.
  The T tension assembly supplied as repair parts differs in the harness length from one used in this unit because of standardization of repair parts. When replacing the T tension assembly, replace the harness by one used in this unit.
- Use a new stop washer when the T tension arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn the power off.
3. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
4. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
5. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

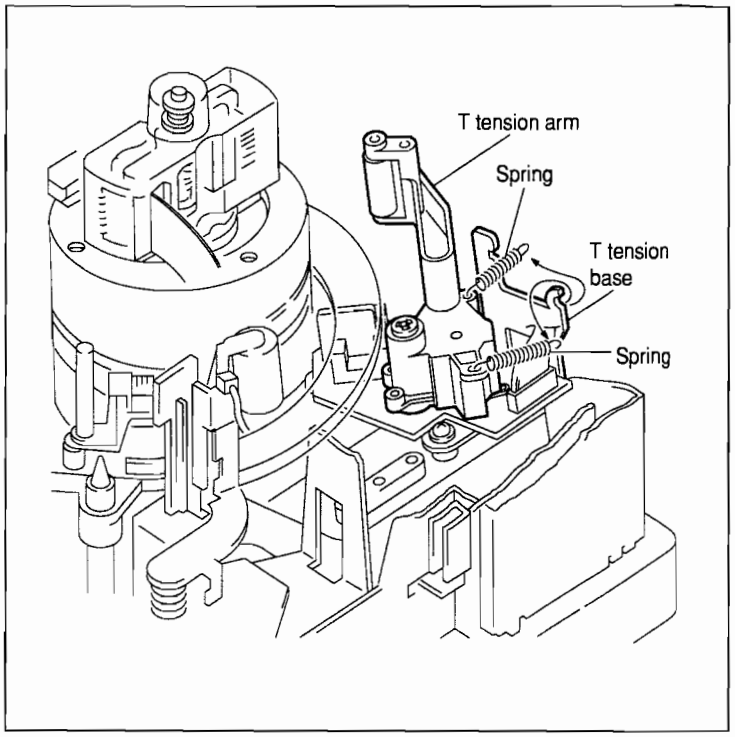
Tools

- Screw-locking compound : 7-432-114-11
- Cleaning fluid : 9-919-573-01
- Cleaning cloth : 3-184-527-01

Removal

1. Remove the Tension Spring

Remove the two springs caught on the T tension base.



Tension Spring Removal

2. Remove the T Tension Arm

(1) Remove the stop washer, and remove the T tension arm.

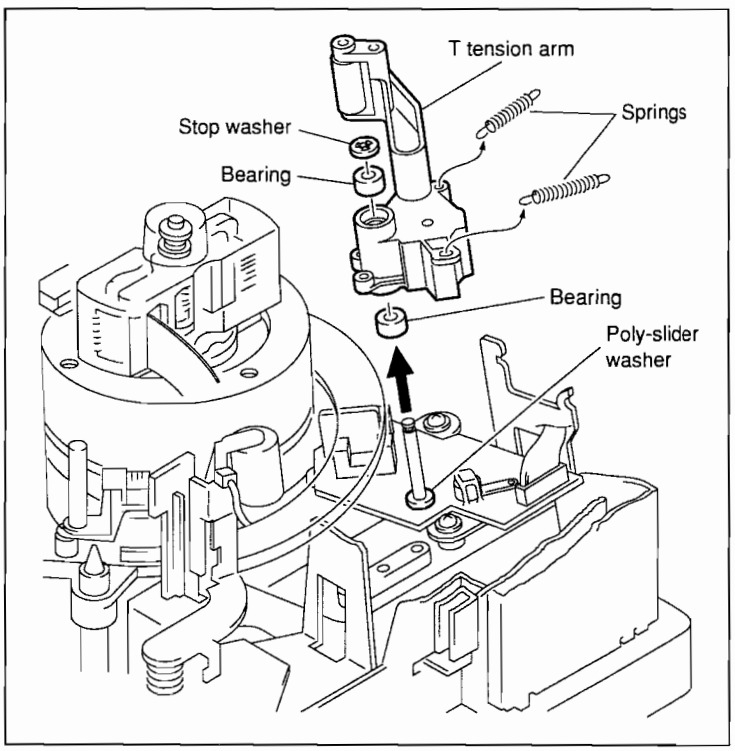
Notes

- Do not reuse the stop washer.
- A polywasher may be attached together when the T tension arm is removed. In this case, remove the polywasher from the T tension arm and return it to the shaft.

(2) Remove the two bearings and two springs from the T tension arm.

Note

The two springs are the same.



T Tension Arm Removal

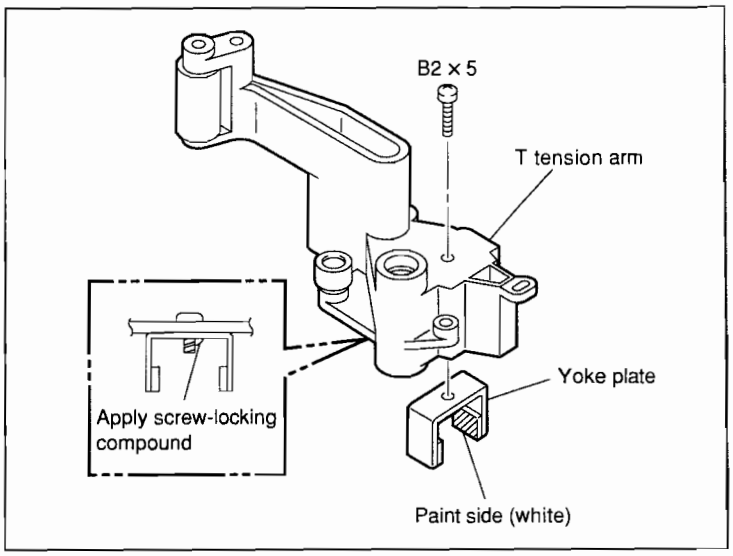
3. Remove the Yoke Plate

Remove the screw, then remove the yoke plate from the T tension arm.

Installation

4. Install the Yoke Plate

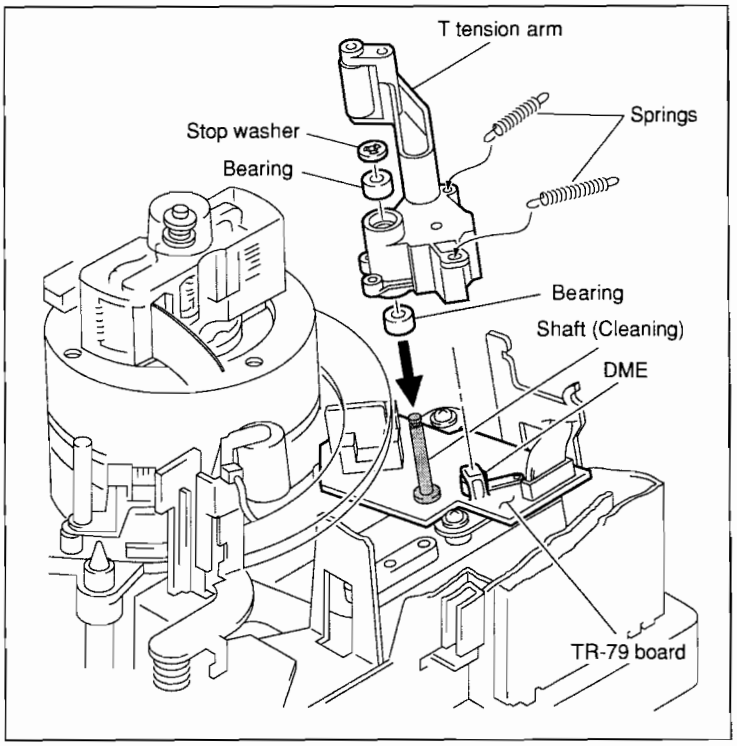
(1) Put the yoke plate in the direction shown in the figure and tighten the screw.
(2) Apply screw-locking compound slightly to the yoke plate.



Yoke Plate Removal/Installation

5. Install the T Tension Arm

(1) Clean the shaft.
(2) Insert the two bearings into the T tension arm.
(3) Put the two springs on the T tension arm as shown in the figure.
(4) Pass the T tension arm through the shaft while putting DME on the TR-79 board in the T tension arm.
(5) Fix the T tension arm using a new stop washer.



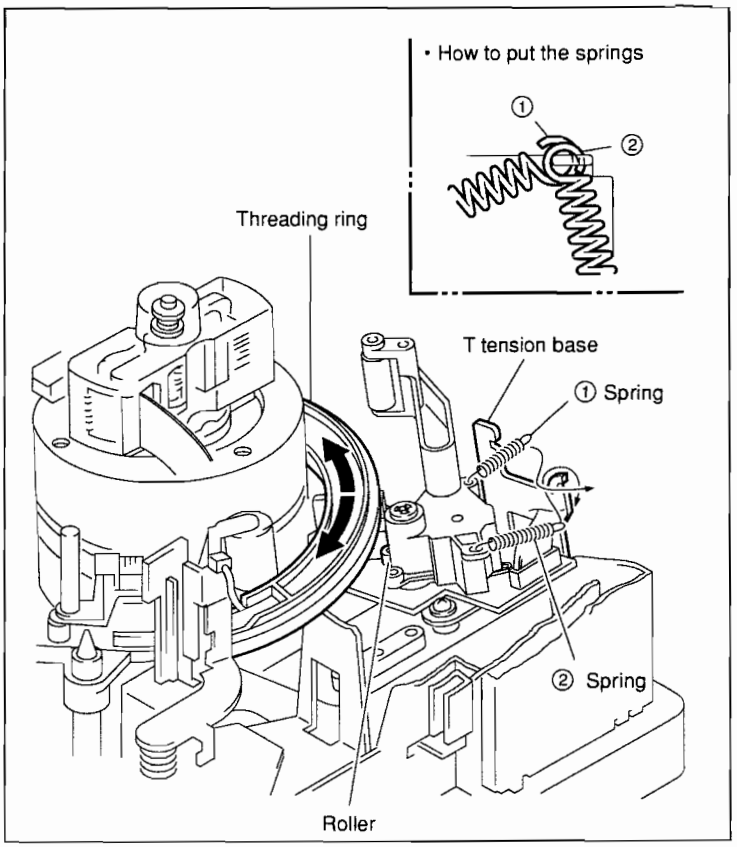
T Tension Arm Installation

6. Install the Tension Spring

Put the two springs removed in (2) of step 2 on the T tension base in the order of ① and ② in the direction shown in the figure.

7. Confirm the T Tension Regulator Operation

Put the threading ring into the threading/unthreading state and confirm that the T tension regulator roller is not dislocated from the threading ring and operates normally.



Tension Spring Installation

Adjustment after Replacement

8. Adjust the Tension Offset

Refer to section 4-4-1. 2 in maintenance manual part 1.
(F 3 : TENSION OFFSET)

9. Save the Adjusted Data

Refer to section 4-4-1. 2 in maintenance manual part 1.
(F 1 : NVRAM CONTROL)

5-26. T Drawer Arm Replacement

Outline

Replacement

1. Remove the T Drawer Assembly
2. Remove the T Drawer Arm
3. Remove the Slant Guide
4. Remove the Slant Guide Base
5. Remove the Drawer Guard
6. Install the Drawer Guard
7. Install the Slant Guide Base
8. Install the Slant Guide
9. Install the T Drawer Arm
10. Install the T Drawer Assembly
11. Confirm the T Drawer Assembly Operation

Adjustment after Replacement

12. Adjust the Slant Guide Slantness (Refer to section 5-26-1.)

Notes

- The slant guide, slant guide base, and drawer guard can be replaced in the same procedure as described in this section.
- Use a new stop washer when the T drawer arm is replaced.
  Stop washer (2.3) : 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn the power off.
3. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
4. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
5. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

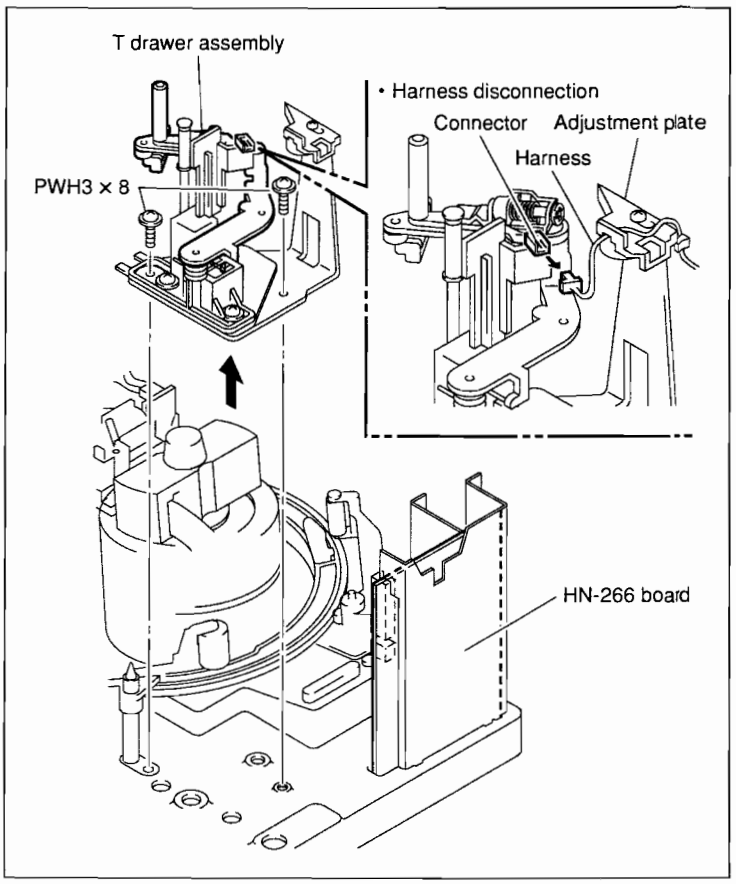
Tools

- Screw-locking compound : 7-432-114-11
- Cleaning fluid : 9-919-573-01
- Cleaning cloth : 3-184-527-01
- Calipers (or the equivalent)

Removal

1. Remove the T Drawer Assembly

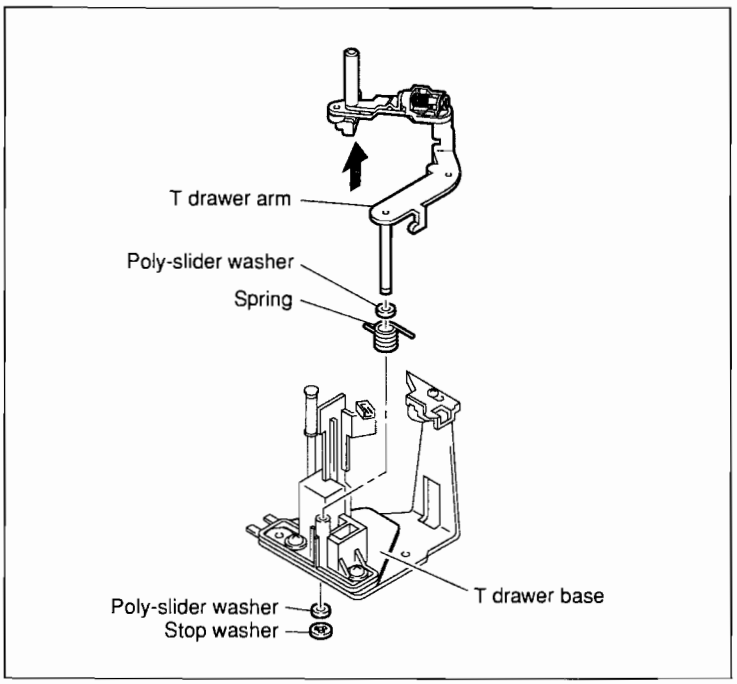
(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the harness from the holder of adjustment plate.
(3) Remove the two screws, and remove the T drawer assembly.



T Drawer Assembly Removal

2. Remove the T Drawer Arm

(1) Remove the stop washer and polywasher, then remove the T drawer arm from the T drawer base.
(2) Remove the spring and polywasher.



T Drawer Arm Removal

3. Remove the Slant Guide
Remove the stop washer, and remove the slant guide and spring from the T drawer arm.

4. Remove the Slant Guide Base
Remove the screw, then remove the slant guide base from the T drawer arm.

5. Remove the Drawer Guard
Remove the screw, and remove the drawer guard from the T drawer arm.

Installation

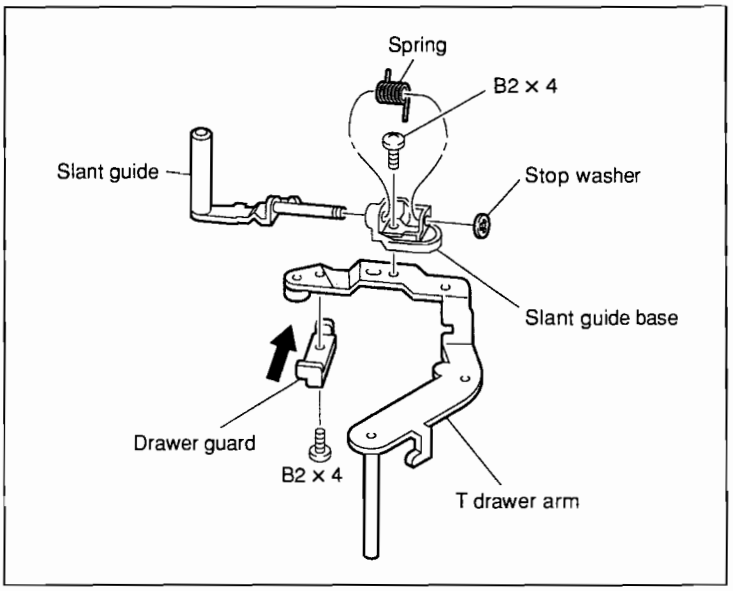
6. Install the Drawer Guard
(1) Push the drawer guard in the arrow direction and tighten the screw.
(2) Apply screw-locking compound to the screw.

7. Install the Slant Guide Base
(1) Move the slant guide base counterclockwise and tighten the screw.
(2) Apply screw-locking compound to the screw.

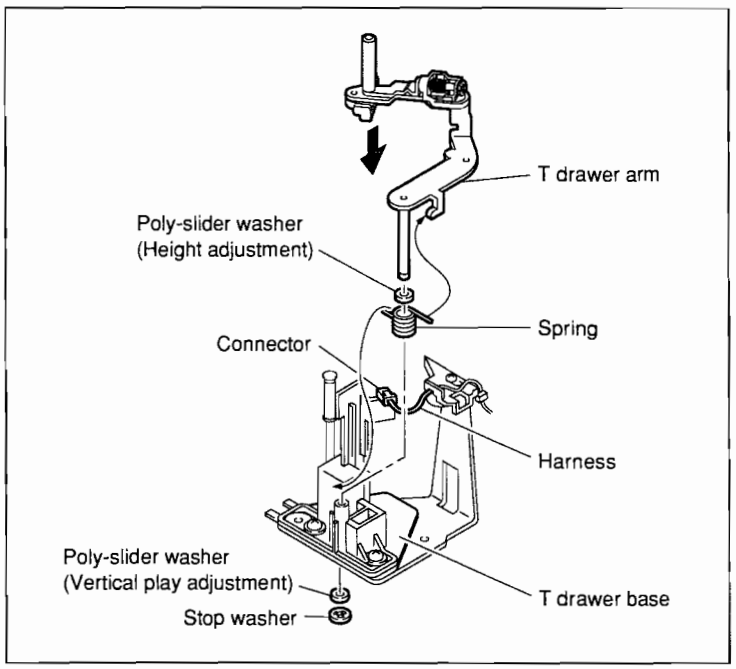
8. Install the Slant Guide
(1) Pass the spring through the Slant guide base while passing it through the slant guide shaft.
(2) Put the spring on the slant guide base.
(3) Fix the slant guide using a new stop washer.

9. Install the T Drawer Arm
(1) Pass the polywasher and spring through the T drawer base while passing them through the shaft of the T drawer arm.
(2) Put the spring on the T drawer arm and T drawer base.
(3) Confirm that specification 1 is met with the T drawer arm pushed downward.

If specification 1 is not met, perform the following adjustment. (Height adjustment)
① Remove the T drawer arm and spring.
② Adjust the polywasher value at the top of the T drawer base.
③ Confirm that specification 1 is met.



T Drawer Arm Disassemble/Assemble



T Drawer Arm Installation

(4) Pass the polywasher through the shaft and fix the T drawer arm using a new stop washer.
(5) Move the T drawer arm manually in the vertical direction. At that time, confirm that the vertical play meets specification 2.

If specification 2 is not met, perform the following adjustment. (Vertical play adjustment)

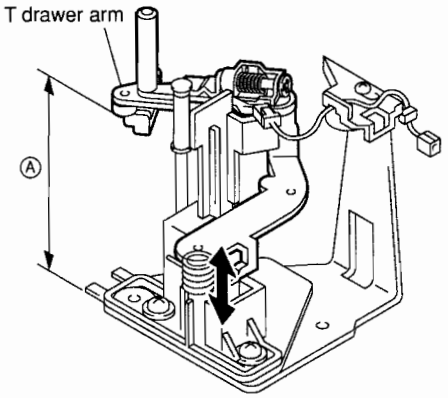
① Remove the stop washer.
② Adjust the polywasher value at the bottom of the T drawer base.
③ Fix the T drawer arm using a new stop washer and confirm that specification 2 is met.

(6) Confirm that the height of the T drawer arm meets the specification 3 with the T drawer arm turned to clockwise by finger.
If specification 3 is not met, perform the procedures (3) and later again.

Note

Some of the T drawer assemblies have no arm stopper. In these cases, the confirmation described above, step 6, is not required.

• T drawer arm height adjustment/vertical play adjustment



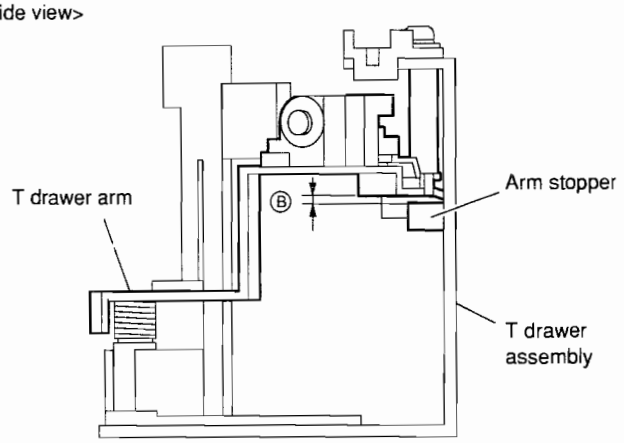
Spec. 1 : (height)
Ⓐ = 36.3 to 36.7 mm
Spec. 2 : (vertical play)
0.2 mm or less

• Spacifications 1 and 2 are not met.

• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11
	0.5 mm	3-701-439-21

<Side view>

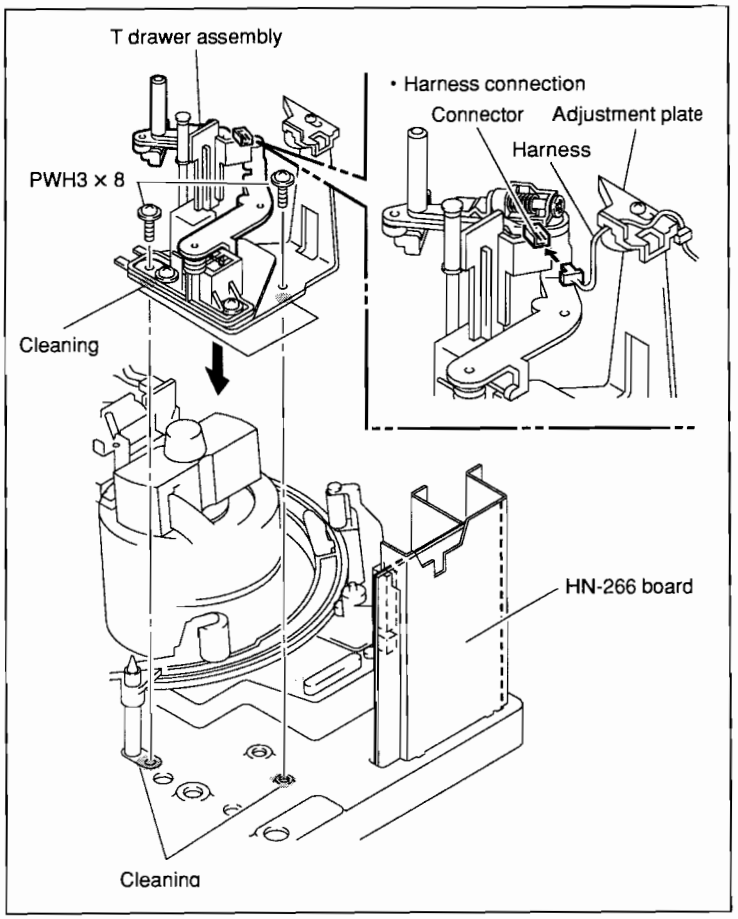


Spec. 3 : Ⓑ ≧ 0.2 mm
(Between arm stopper and arm)

T Drawer Arm Installation

10. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



T Drawer Assembly Installation

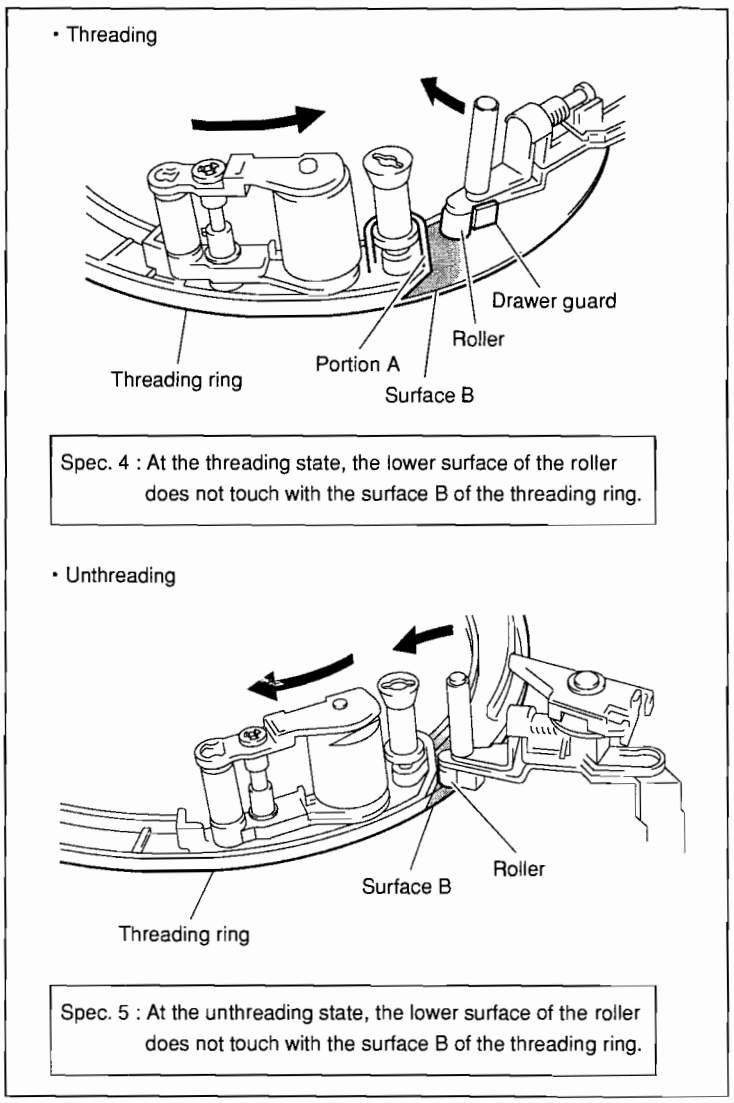
11. Confirm the T Drawer Assembly Operation

(1) Confirm that portion A of the threading ring is pushing the roller and drawer guard of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (▒ portion in the figure) of the threading ring at that time. (Specification 4)

If specification 4 is not met, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (▒ portion in the figure) of the threading ring at that time. (Specification 5)

If specification 5 is not met, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)


• Threading
Drawer guard
Roller
Portion A
Threading ring
Surface B
Spec. 4 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.
• Unthreading
Roller
Surface B
Threading ring
Spec. 5 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

T Drawer Assembly Operation Confirmation

Adjustment after Replacement

12. Adjust the Slant Guide Slantness

Refer to section 5-26-1.

5-26-1. Slant Guide Slantness Adjustment

Note

Be sure to perform this adjustment when the T drawer arm and slant guide are replaced.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Tension regulator verticality check tool (BW-080) : J-6190-800-A
- Thickness gauge : 9-911-053-00
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Screw-locking compound : 7-432-114-11
- Cassette tape for HD CAM (L cassette)

Confirmation

1. Install the Cassette Reference Plate (L)

Put the cassette reference plate (L) in the direction shown in the figure and align it with the two cassette posts.

2. Confirm the Slant Guide Slantness

(1) Press the check tool against the slant guide from the directions indicated by arrows A and B.

(2) Confirm that the clearance between the slant guide and tool meets specifications 1 and 2.

If specifications 1 and 2 are not met, repeat procedures 1 and 2 below until they are met.

① Bend the slant guide so that specifications 1 and 2 are met.

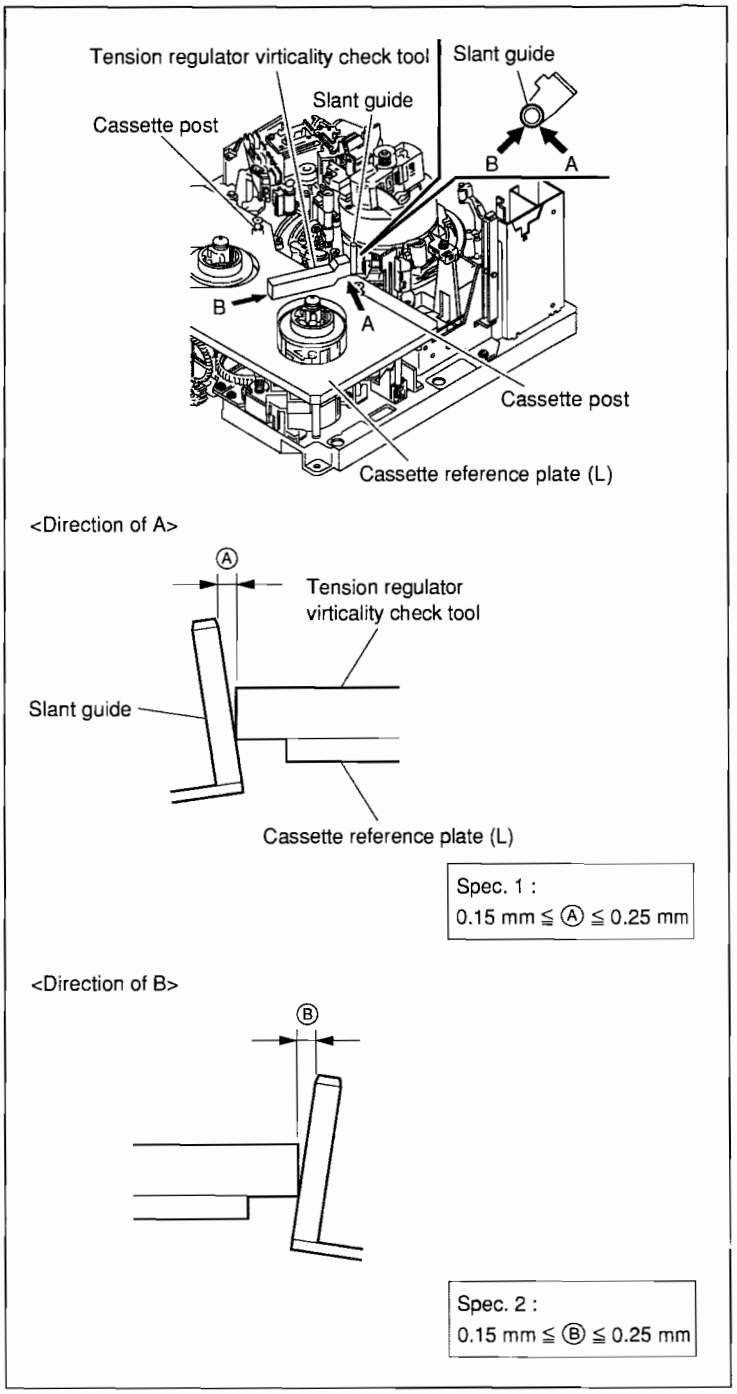
② Repeat the threading/unthreading and reconfirm that specifications 1 and 2 are met.

3. Remove the Cassette Reference Plate (L)

Remove the tension regulator verticality check tool and cassette reference plate (L).

4. Cleaning

Clean the slant guide with cleaning cloth moistened with cleaning fluid.



Slant Guide Slantness Confirmation

5. Set the L Cassette Tape

(1) Put the RS table block assembly into the L cassette position.

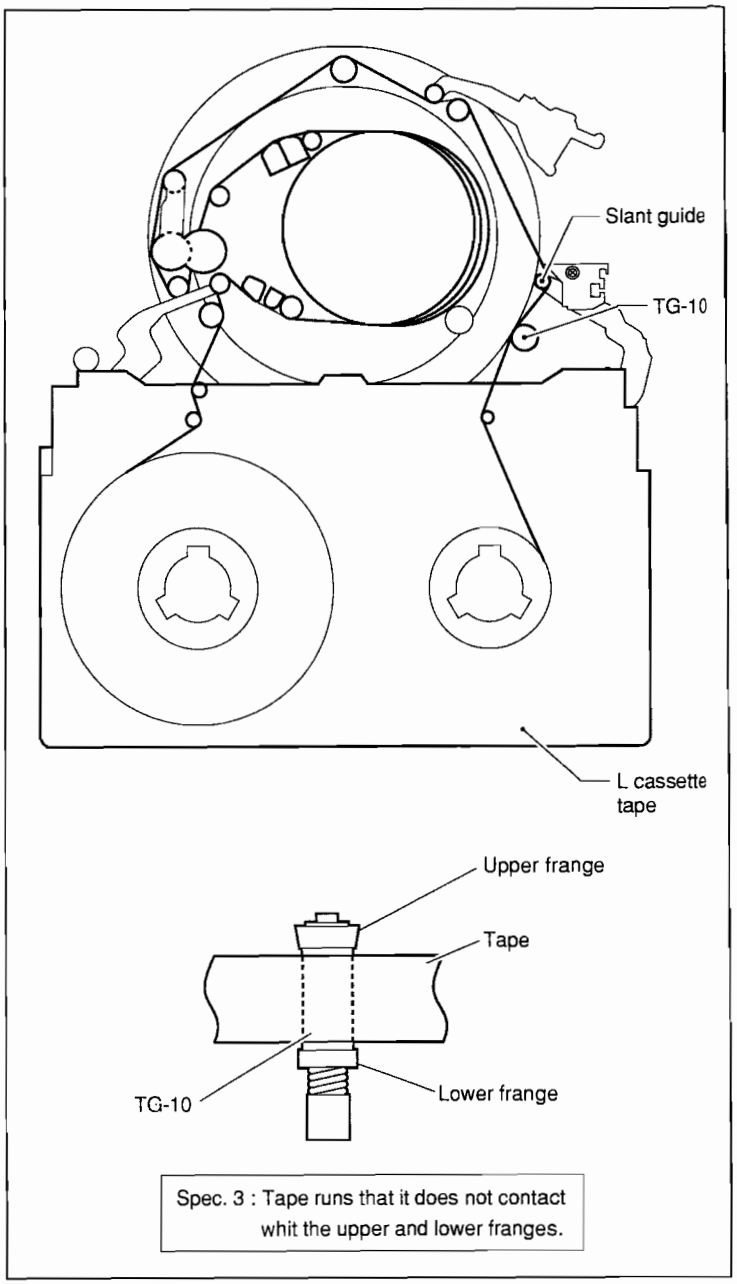
(2) Set the L cassette tape and put a weight so that the cassette is stable.
Weight about 1,000 g is suitable.

6. Confirm the Tape Running at TG-10 Guide

(1) Put the unit into the F.FWD mode, then put it into the PLAY mode after approximately three seconds.

(2) Confirm that the tape runs at the TG-10 guide with specification 3 is met state.

If specification 3 is not met, perform the adjustments in procedures 7 and later.



Tape Running at TG-10 Guide Confirmation

Adjustment

7. Loosen the Screw

Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.

8. Adjust the Slant Guide Slantness

(1) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the adjustment plate so that specification 3 is met.

- When the tape touches with the upper flange :
  Move the adjustment plate in the arrow A direction.
- When the tape touches with the lower flange :
  Move the adjustment plate in the arrow B direction.

9. Tighten the Screw

Tighten the screw loosened in procedure 7.

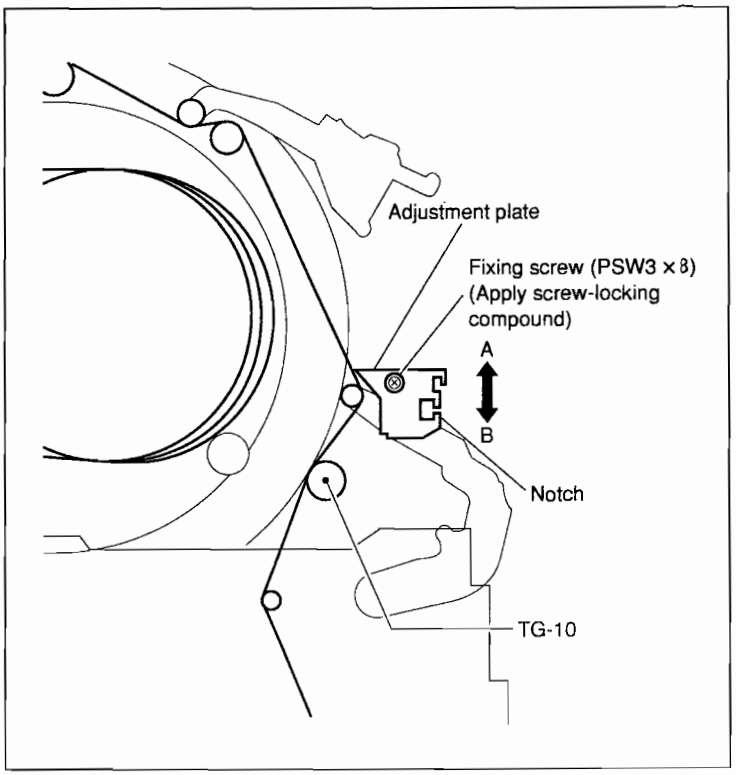
10. Confirm the Tape Running at TG-10 Guide

(1) Put the unit into the unthreading end mode.
(2) Put the unit into the PLAY mode again, and reconfirm that the tape runs at the TG-10 guide with specification 3 is met state.

If specification 3 is not met, repeat procedures 7 through 10.

11. Apply Screw-locking Compound

Apply the screw-locking compound to the securing screw of the adjustment plate.



Slant Guide Slantness Adjustment

5-27. Cassette Compartment Motor Replacement

Outline

Replacement

1. Disconnect the Harness (CN935/CL-29 Board)
2. Remove the Warm Section
3. Remove the Cassette Compartment Motor
4. Remove the Motor Joint
5. Remove the Spacer and Disconnect the Harness
6. Solder the Harness
7. Install the Motor Joint
8. Install the Spacer and Warm
9. Install the Cassette Compartment Motor
10. Smear Grease
11. Connect theHarness (CN935/CL-29 Board)

Adjustment after Replacement

12. Confirm the Cassette Compartment Motor Operation
    (Refer to section 4-3-2. 1 in maintenance manual part 1.)
    ([F 8] : CASSETTE COMP.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)

Tools

- L wrench (D = 0.89 mm) : 7-700-736-06
- Grease (SGL-601) : 7-651-000-10
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Calipers (or the equivalent)

Removal

1. Disconnect the Harness

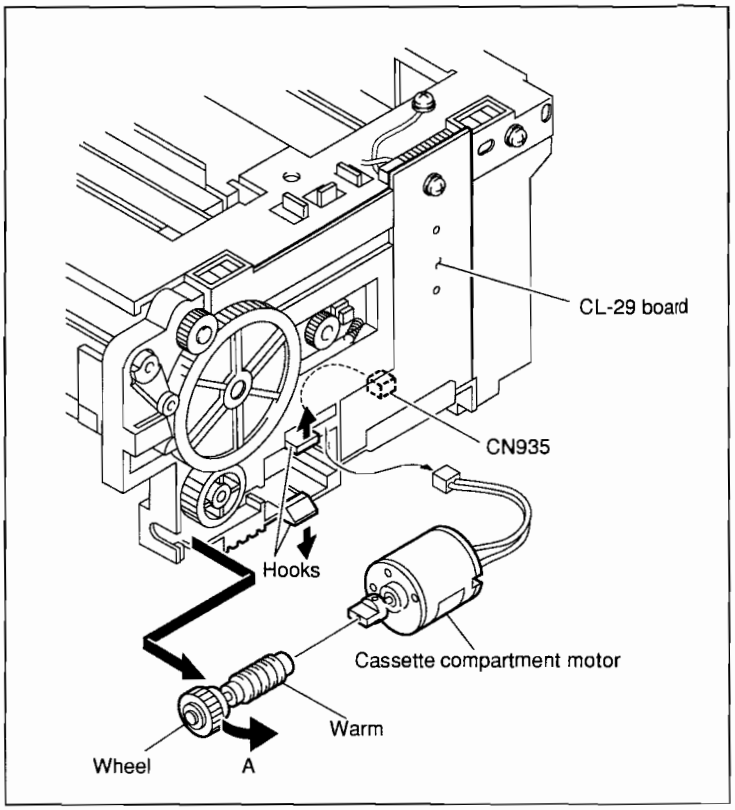
Disconnect the harness from the connector CN935 on the CL-29 board.

2. Remove the Warm Section

Push the wheel in the direction indicated by arrow A and take out the warm.

3. Remove the Cassette Compartment Motor

Spread the hooks of the chassis and push out the cassette compartment motor from the inside of the cassette compartment.



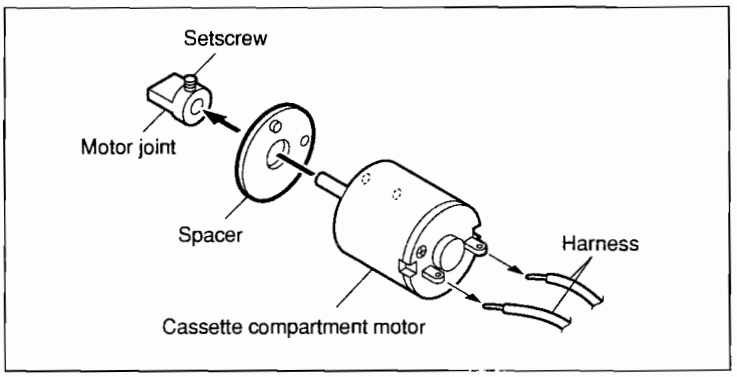
Cassette Compartment Motor Removal (1)

4. Remove the Motor Joint

Loosen the setscrew by two to three turns and remove the motor joint.

5. Remove the Spacer and Disconnect the Harness

(1) Remove the spacer.
(2) Unsolder and disconnect the harness from the motor.



Cassette Compartment Motor Removal (2)

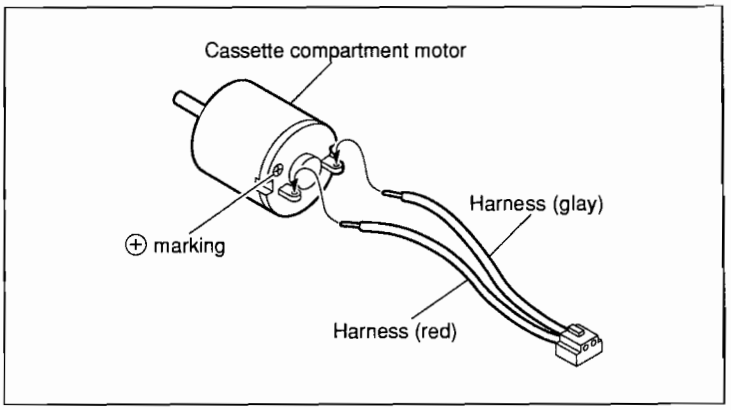
Installation

6. Solder the Harness

Solder the harness disconnected in step (2) of procedure 5 to a new motor.

Note

Solder a red harness to marking "+" of the motor.



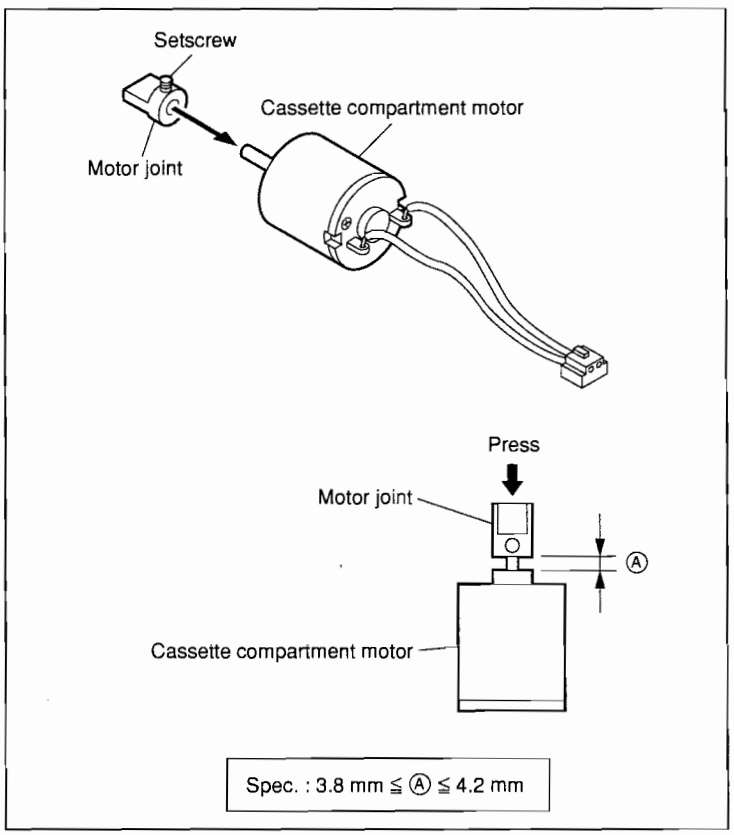
Harness Soldering

7. Install the Motor Joint

(1) Pass the motor joint through the shaft of the motor and fix the setscrew temporarily.

(2) Confirm that the clearance between the motor joint and motor meets the specification when the motor joint is pushed toward the motor and tighten the setscrew.

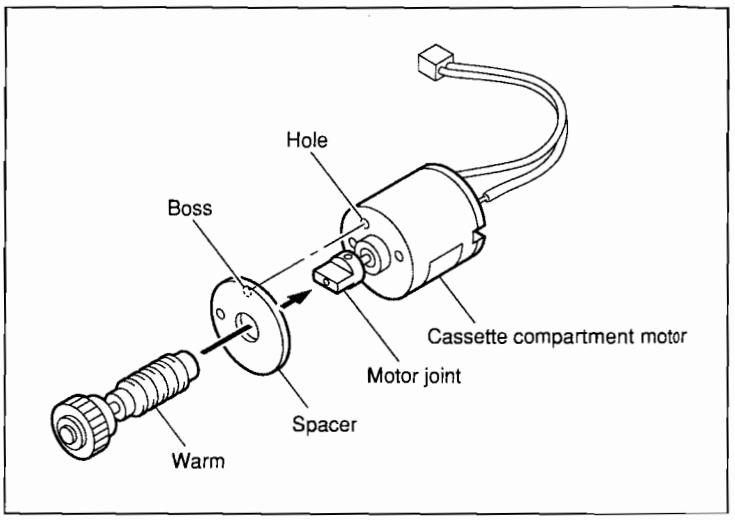
Tightening torque : 60×10^{-2} N•m (6 kgf•cm)



Motor Joint Installation

8. Install the Spacer and Warm Section

(1) Put the boss of the spacer in the hole of the motor.
(2) Align the warm with the motor joint, then insert it.



Spacer and Warm Installation

9. Install the Cassette Compartment Motor

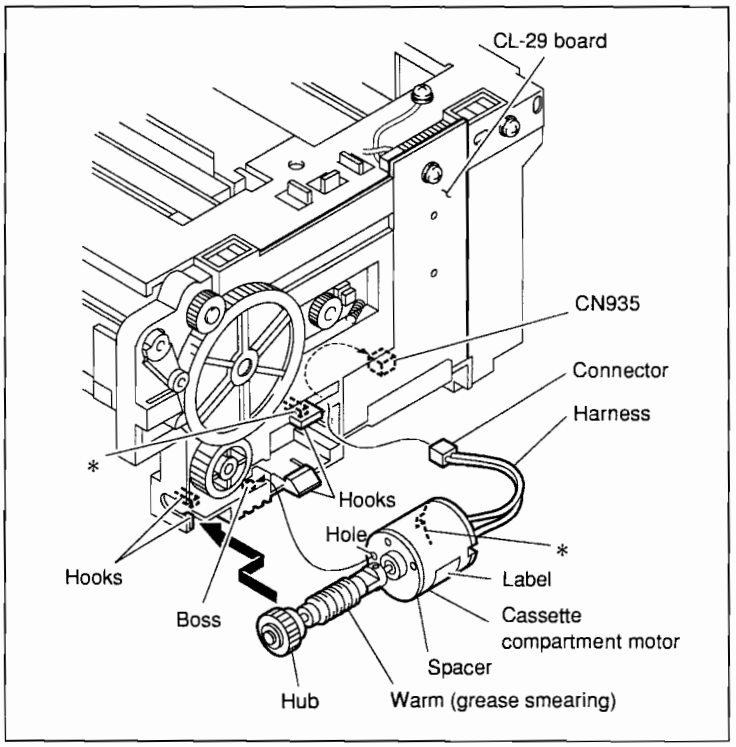
(1) Put the motor in the direction shown in the figure and pass the harness through the hole of the chassis.
(2) Place the ∗-marked portion of the motor shown in the figure and put the motor in the two hooks while inserting the hole of the spacer into the boss of the chassis. Simultaneously, put the hub of the warm in the two hooks of the chassis.
(3) Confirm that the motor has been fixed.

10. Smear Grease

(1) Wipe the grease on the warm and clean it.
(2) Smear grease slightly to the warm.

11. Connect the Harness

Connect the connector of the cassette comportment motor's harness to connector CN935 on the CL-29 board.



Cassette Compartment Motor Installation

Adjustment after Replacement

12. Confirm the Cassette Compartment Motor Operation

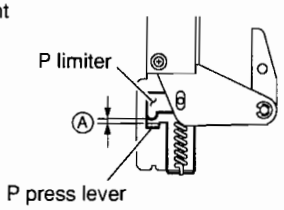
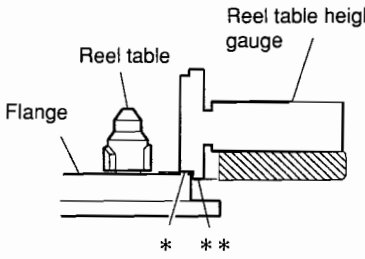
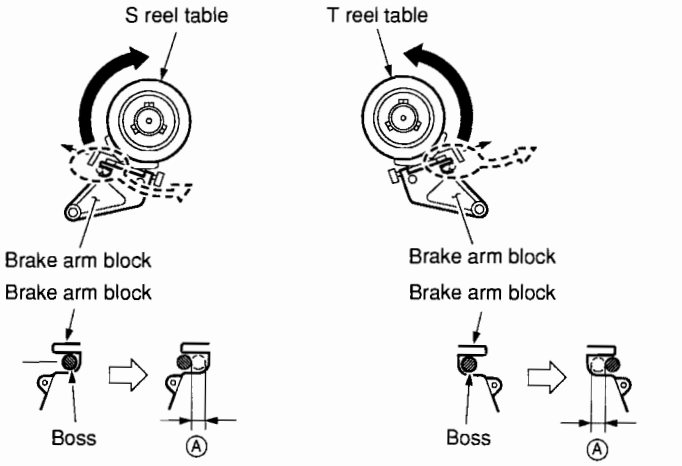
Refer to section 4-3-2. 1 in maintenance manual part 1.
(F 8 : CASSETTE COMP)

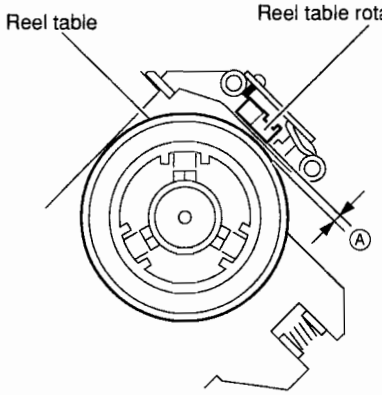
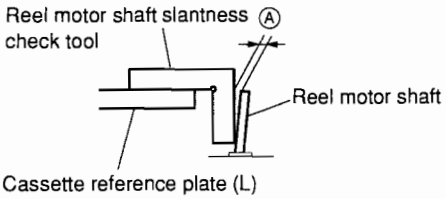
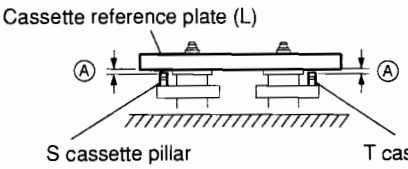
Note

Perform this check with the cassette compartment installed in the unit.

5-28. Mechanical Adjustment Table

Index

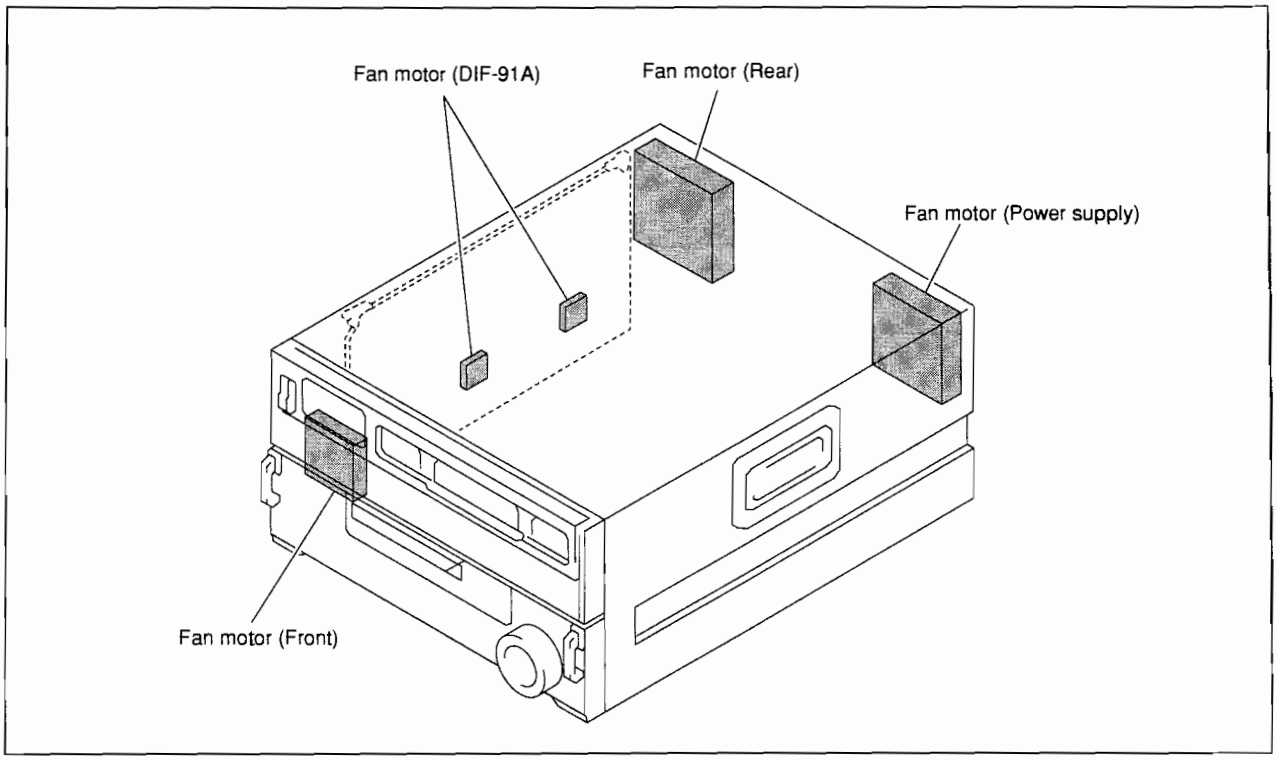
Adjustment	Specification	Page
Pinch Press Clearance Adjustment	 Spec. : Ⓐ = 0.6 to 0.8 mm	5-70
Reel Table Height Adjustment	 Spec. : The * marked portion of the gauge slide over the frange of the reel table. The ** marked portion of the gauge does not slide over.	5-81
Reel Brake Clearance Check	 Spec. : Ⓐ = Clearance exists. Spec. : Ⓐ = Clearance exists.	5-84
Reel Brake Release Amount Adjustment	Spec. : The brake lining does not touch a reel table while reel table rotating.	5-85

Adjustment	Specification	Page
Reel Rotation Sensor Position Adjustment	 Spec. : Ⓐ = 0.1 mm or more	5-87
Reel Motor Shaft Slantness Adjustment	 Spec. 1 : (L cassette position) Ⓐ ≦ 0.03 mm Spec. 2 : (S cassette position) Ⓐ ≦ 0.1 mm	5-102
Cassette Pillar Height Adjustment	 Spec. : Ⓐ = No clearance exists.	5-105

5-29. Fan Motor Replacement

This unit has five fan motors. All fan motors should be replaced within a certain period of operating hours. Regarding operating hours, refer to section 5-1-2 in maintenance manual part 1.

1. Index

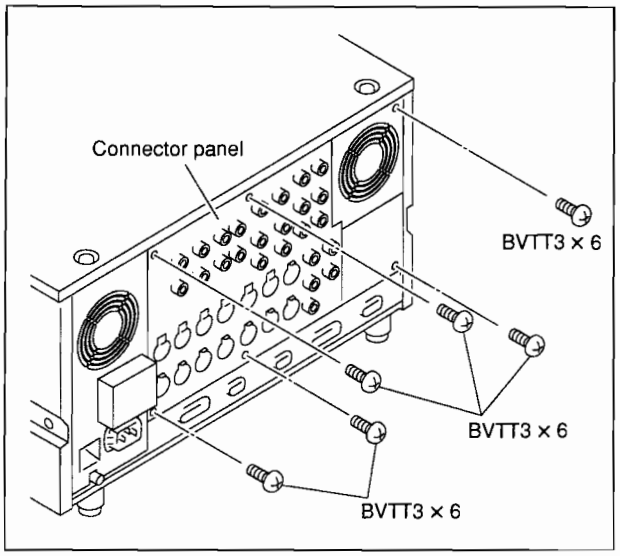


2. Notes

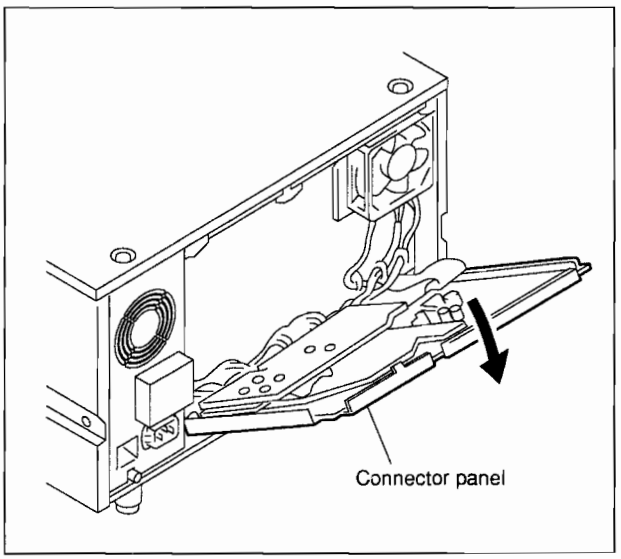
- Replace the fan motors when displaying a alarm informing for fan motor in addition to the periodic replacement.
- When the fan motor stops because of trouble, some components inside the unit may be heated to high temperatures.
  Take care not to burn your hands by touching these components.
  In service operation, turn off the power and perform the service operation after the temperatures turns to ordinary state.

5-29-1. Rear Fan Motor Replacement

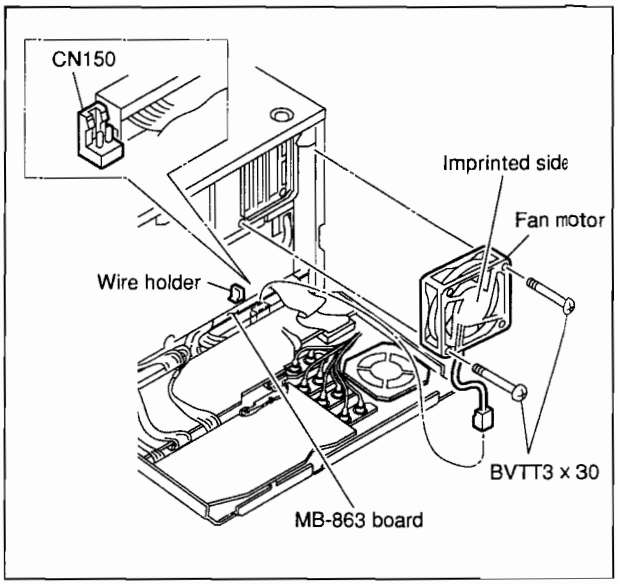
1. Turn the power off.
2. Remove the six screws from the "⇒" mark portions of the connector panel.



3. Open the connector panel without stretching the harness.



4. Disconnect the connector CN150 on the MB-863 board.
5. Remove the fan motor harness from the wire holder.
6. Remove the two screws and remove the fan motor.



7. Attach the new fan motor in the reverse order of above procedures.

Note

Be very carefull when attaching the fan motor. Keep letters on the fan motor facing in front and harness downward.

5-29-2. Power Supply Fan Motor Replacement

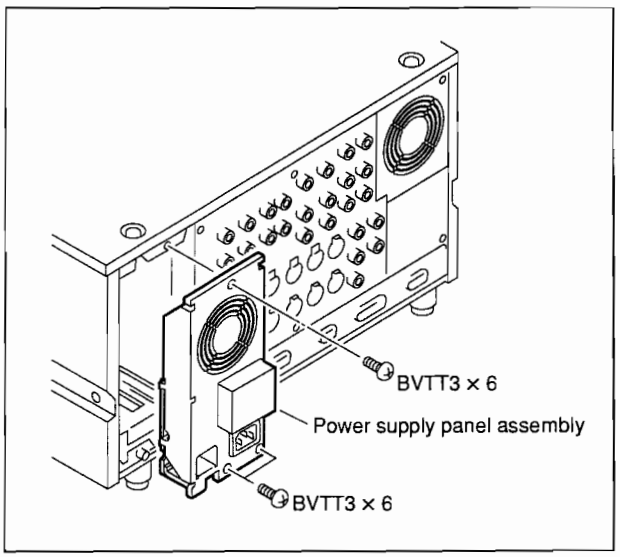
WARNING

Be sure to turn off the power and disconnect the power cable from the unit before launching the servicing.

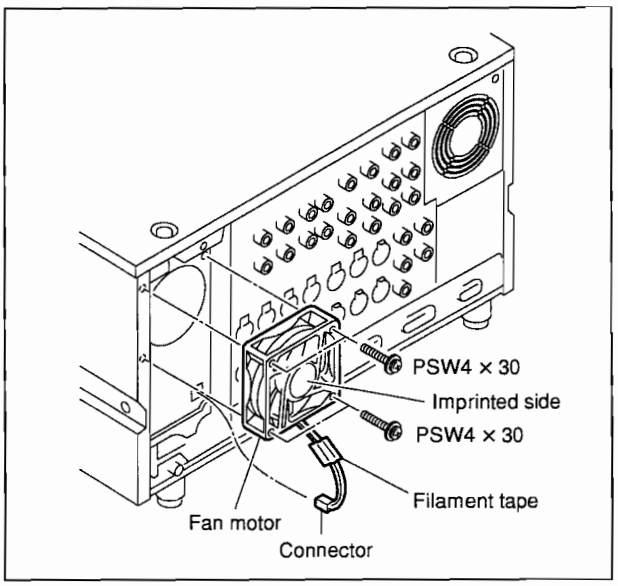
1. Remove the three screws and remove the power supply panel assembly.

Note

Needless to disconnect harnesses from the board of the power supply panel assembly.



2. Peel a filament tape off from the fan motor harness.
3. Disconnect the fan motor harness from the connector as shown in the figure.
4. Remove the four screws, and remove the power supply fan motor.



5. Attach the fan motor in the reverse order of above procedures.

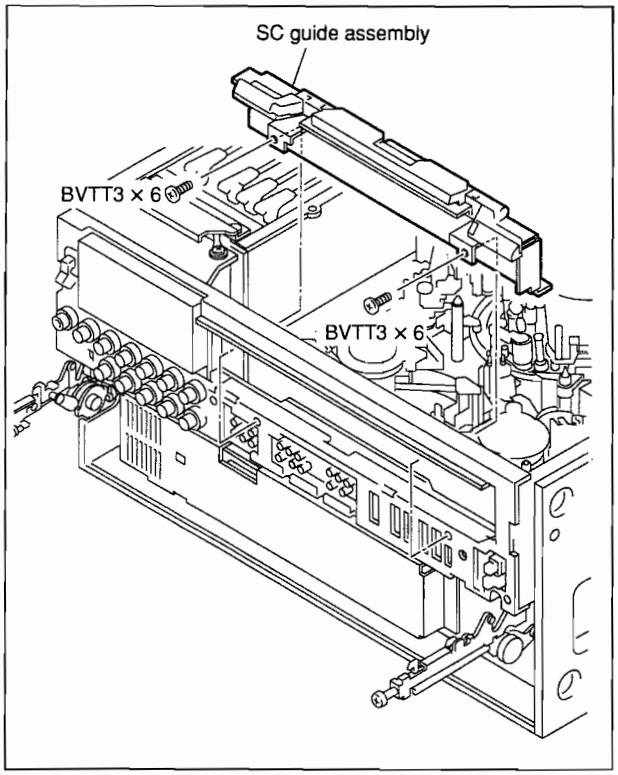
Notes

(1) Be very carefull when attaching the fan motor. Keep letters on the fan motor facing in front and harness downward.

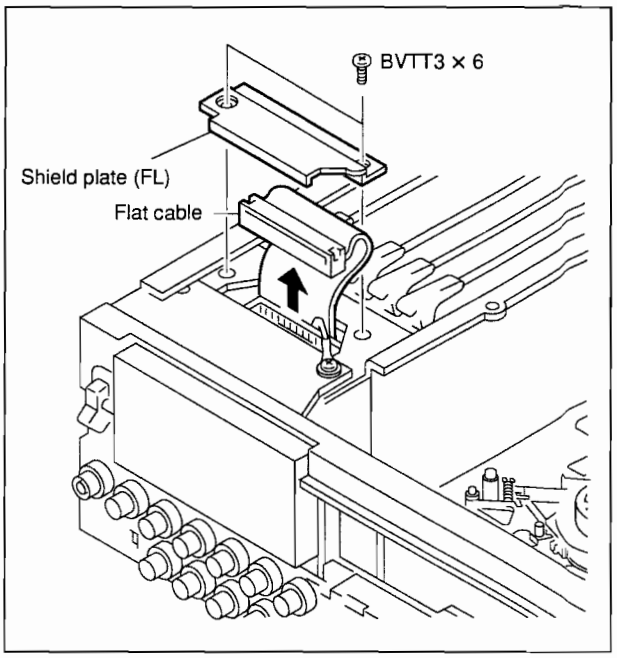
(2) After replacement, be sure to fix the fan motor harness with new filament tape.

5-29-3. Front Fan Motor Replacement

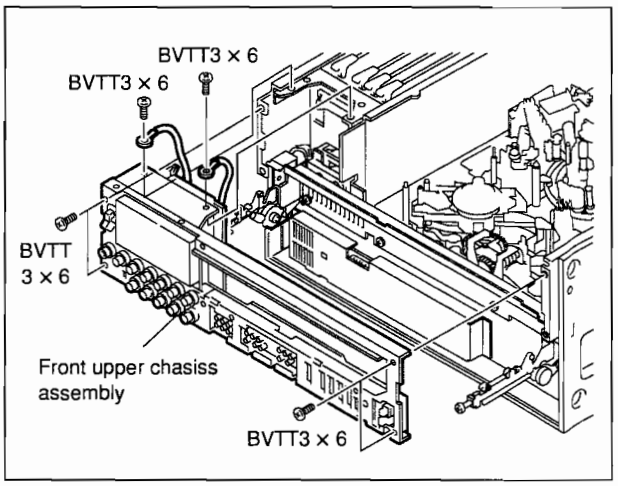
1. Turn the power off.
2. Remove the control panel assembly. (Refer to "Section 2-4. Removing/Installing the Lower Control Panel" in maintenance manual part 1.)
3. Remove the upper control panel. (Refer to "Section 2-5-2. Removing/Installing the Upper/Lower Control Panel" in maintenance manual part 1.)
4. Remove the cassette compartment. (Refer to "2-7. Removing/Installing the Cassette Compartment" in maintenance manual part 1.)
5. Remove the two screws and remove the SC guide assembly.



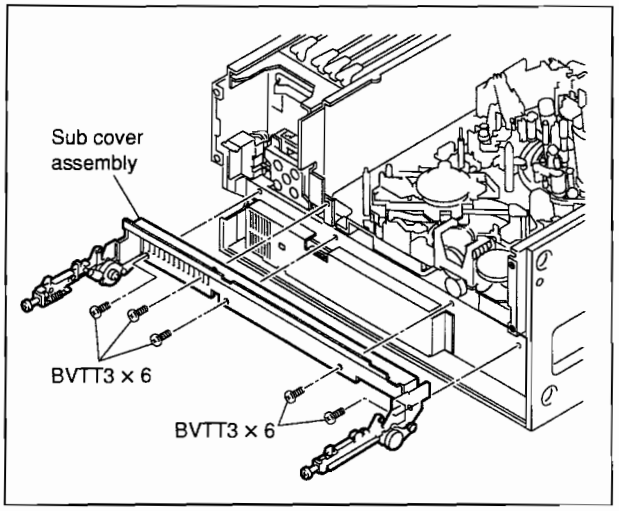
6. Remove the two screws and remove the shield plate (FL).
7. Disconnect the flat cable on the FP-103 board.



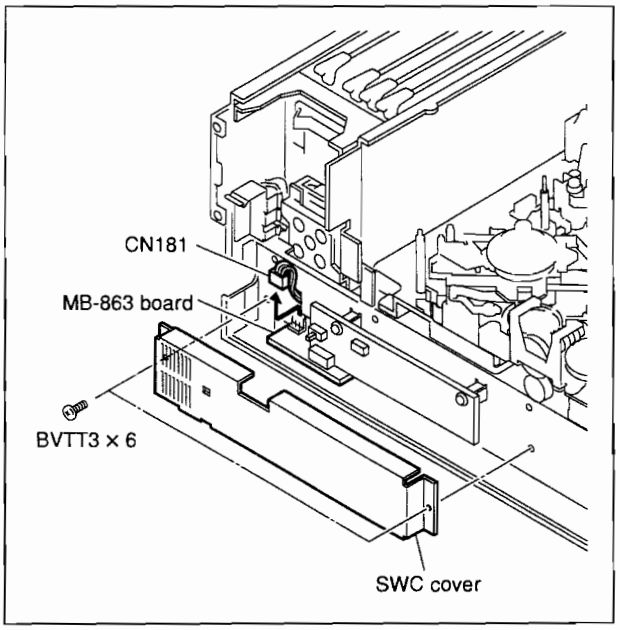
8. Remove the six screws and remove the front upper chassis assembly.



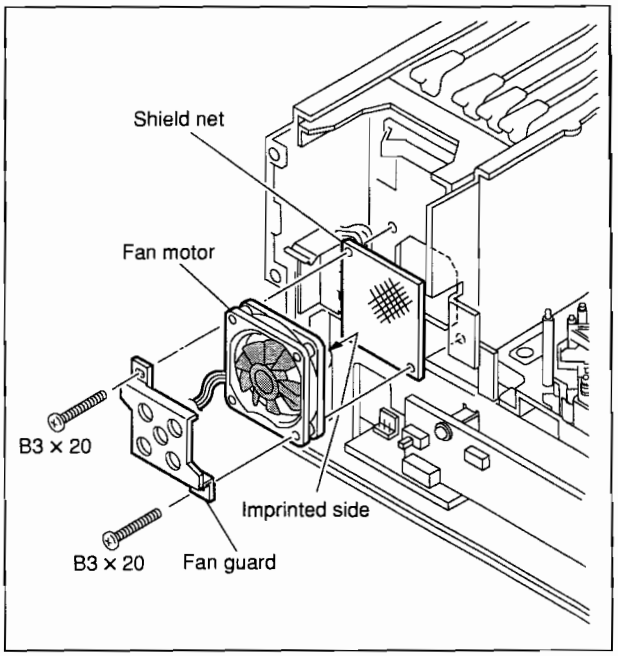
9. Remove the five screws and remove the SUB cover assembly.



10. Remove the two screws and remove the SWC cover.
11. Disconnect the CN181 connector on the MB-863 board.



12. Remove the two screws and remove the fan guard, fan motor and shield net.



13. Attach the parts in the reverse order of above procedures.

Note

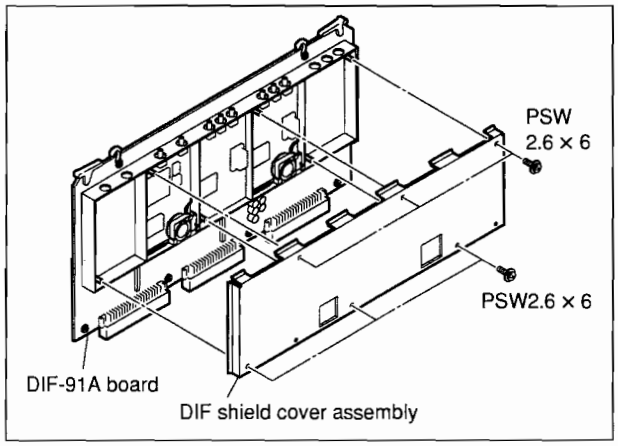
Be very carefull when attaching the fan motor. Keep letters on the fan motor facing in back and harness downward.

5-29-4. Fan Motor on DIF-91A Board Replacement

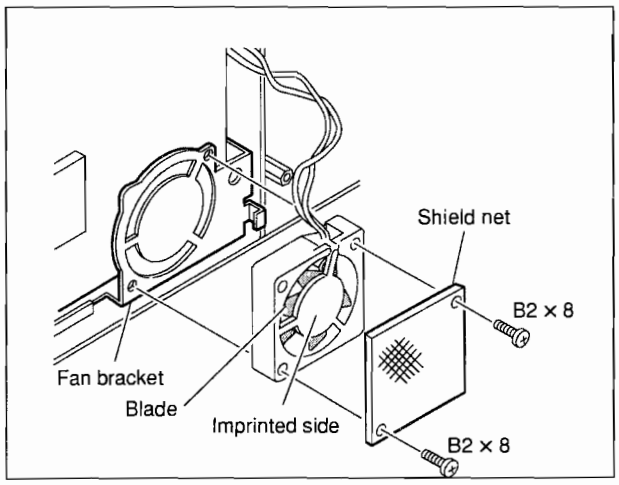
Tool

- Sony bond (SC608LV) : 7-432-912-52

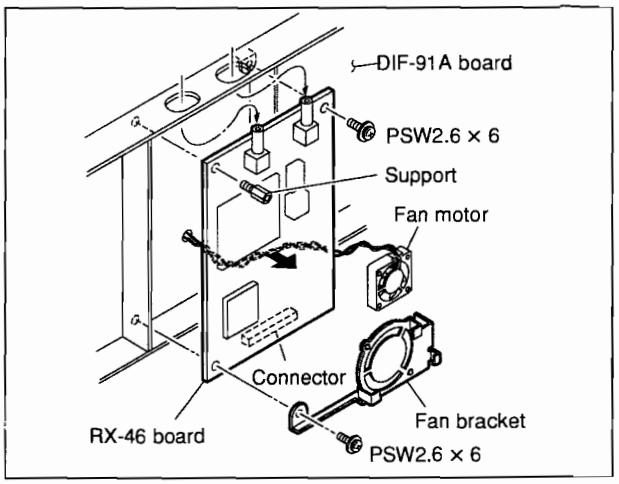
1. Turn the power off.
2. Remove the DIF-91A board from the unit. (Refer to "2-10-1. Removing/Installing the Plug-In Board" in maintenance manual part 1.)
3. Remove the six screws and remove the DIF shield cover assembly.



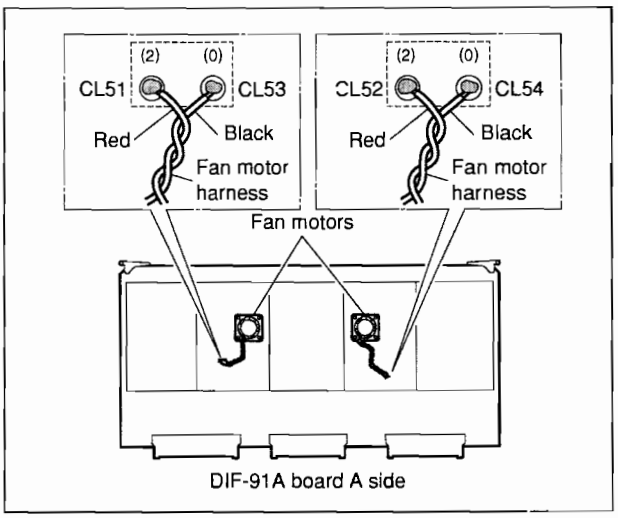
4. Remove the two screws, then remove the shield net and the fan motor.



5. Remove the two screws and one support, and remove the RX-46 board (or TX-68 board) and fan bracket. When removing the RX-46 (or TX-68 board), move it toward the arrow direction, and disconnect a connector in the back side.



6. Desolder the fan motor harness from the A-side of the DIF-91A board, and remove the fan motor.



7. Fan Motor Harness Connection

(1) Cut both the red and black lead wires of the new fan motor to 70 mm.

(2) Solder both lead wires to A-side of the DIF-91A board as shown in the figure.

8. Fixing the Fan Motor Harness
   Apply Sony bond, and fix the fan motor harness to A-side of the DIF-91A board.
9. Attach the parts in the reverse order of procedures.

Note

Be sure to fix the fan motor correct direction (letters on the fan motor facing in front and harness upward) as shown in the figure of procedure 4.

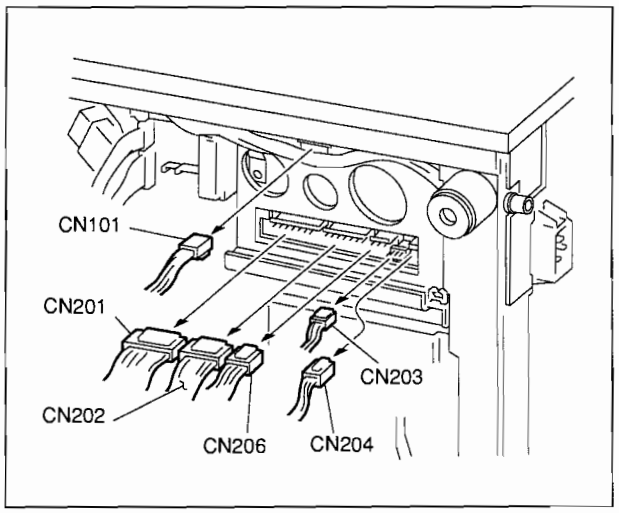
5-30. Power Supply Unit Replacement

WARNING

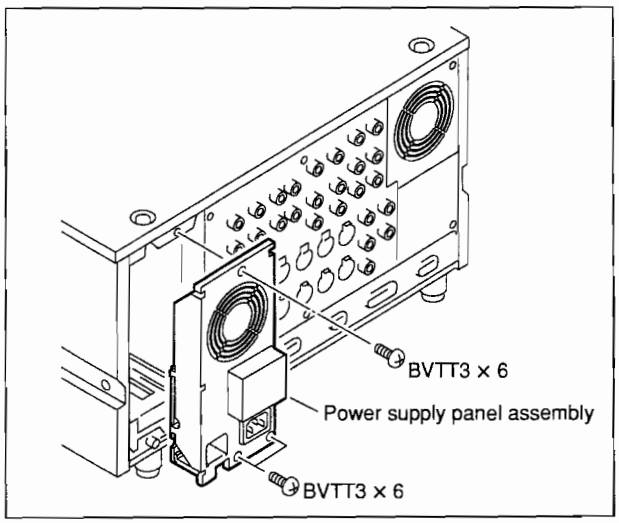
In order to prevent electric shock, be sure to turn off the power and disconnect the power cord before servicing.

After the Replacement of the power supply unit, check all power voltages. (Refer to section 3-1-1.)

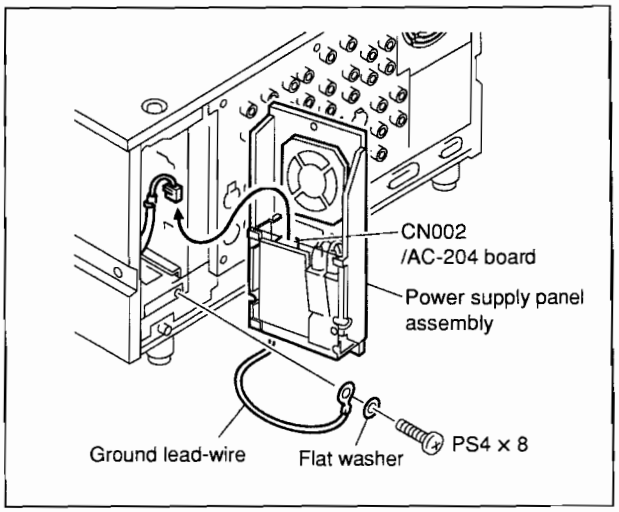
1. Lay the unit on its left side panel downward.
2. Remove the bottom panel.
   (Refer to section 2-5 in maintenance manual part 1.)
3. Disconnect the six connectors (CN101, CN201, CN202, CN203, CN204 and CN206).



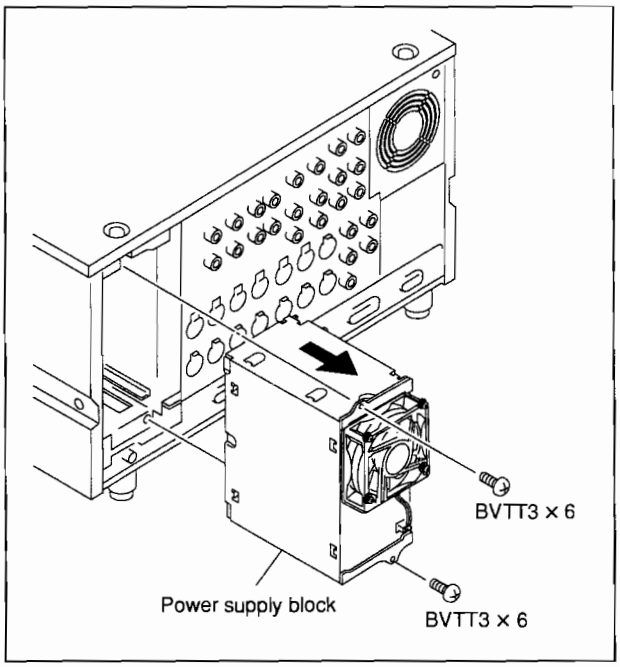
4. Remove the three screws and remove the power supply panel assembly.



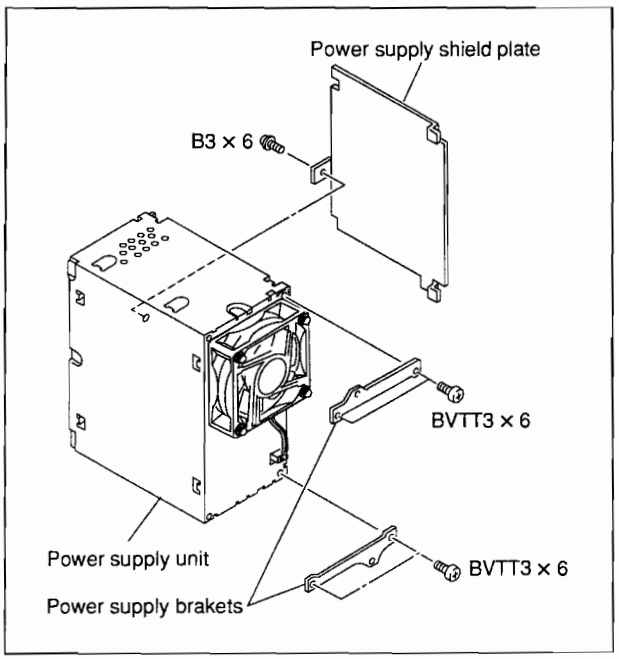
5. Disconnect the harness from the connector CN202 on the AC-204 board.
6. Remove the screw and flat washer which is fixing the ground lead-wire to chassis, and remove the power supply panel assembly.



7. Remove the two screws and remove the power supply block.



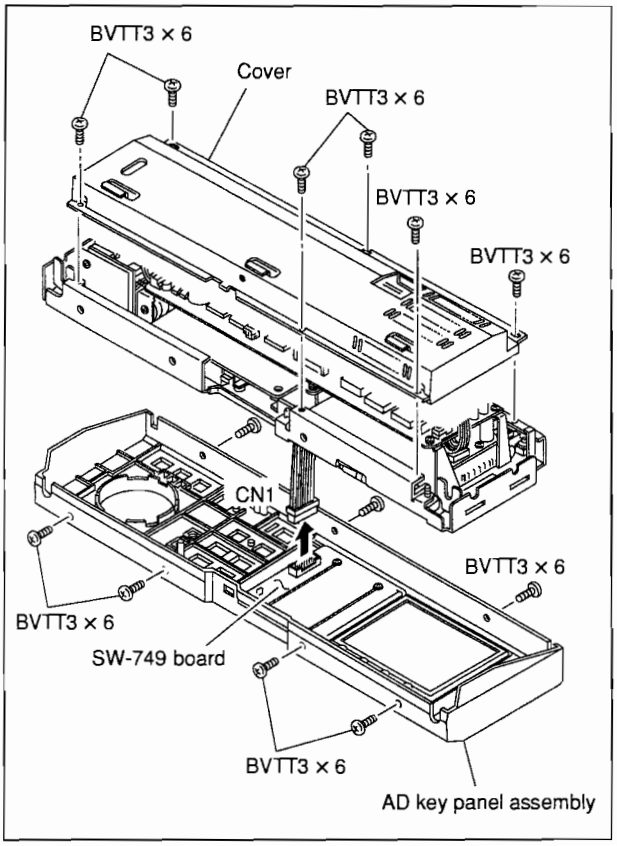
8. Remove the four screws and remove the two power supply brackets.
9. Remove the screw and remove the power supply shield plate.



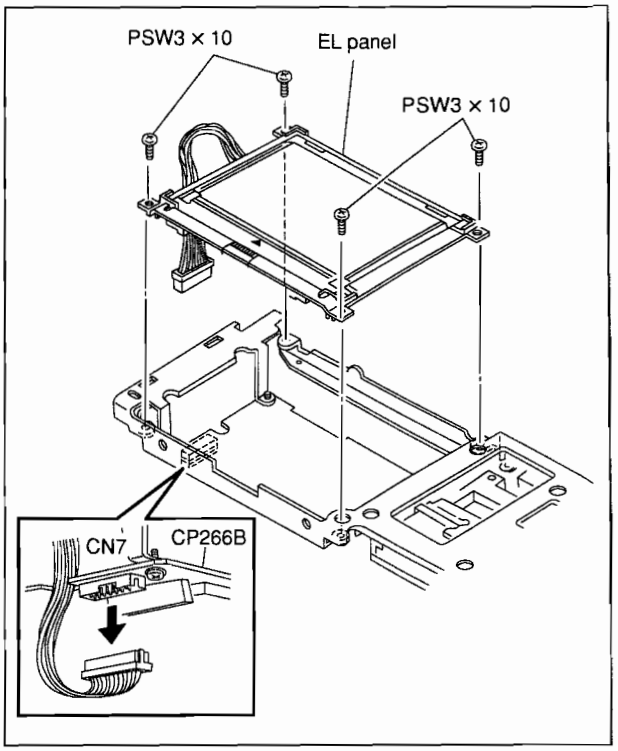
10. Assemble the parts in the reverse order of above procedures 1 through 9.

5-31. EL Panel Replacement

1. Turn the power off.
2. Remove the lower control panel assembly. (Refer to section 2-4 in maintenance manual part 1.)
3. Remove the six screws and remove the cover.
4. Remove the seven screws and disconnect connector CN1 on the SW-749 board with the frame lifted from the AD key panel assembly.



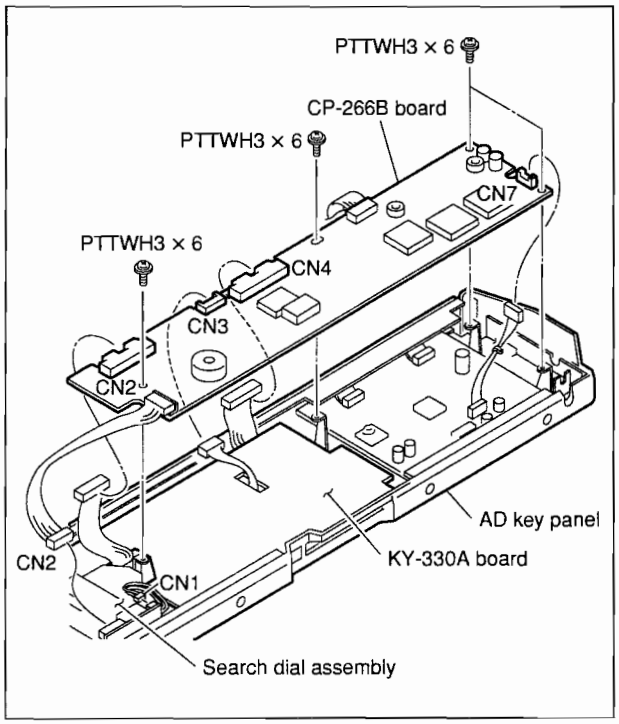
5. Disconnect connector CN7 on the CP-266B board. Remove the four screws and remove the EL panel.



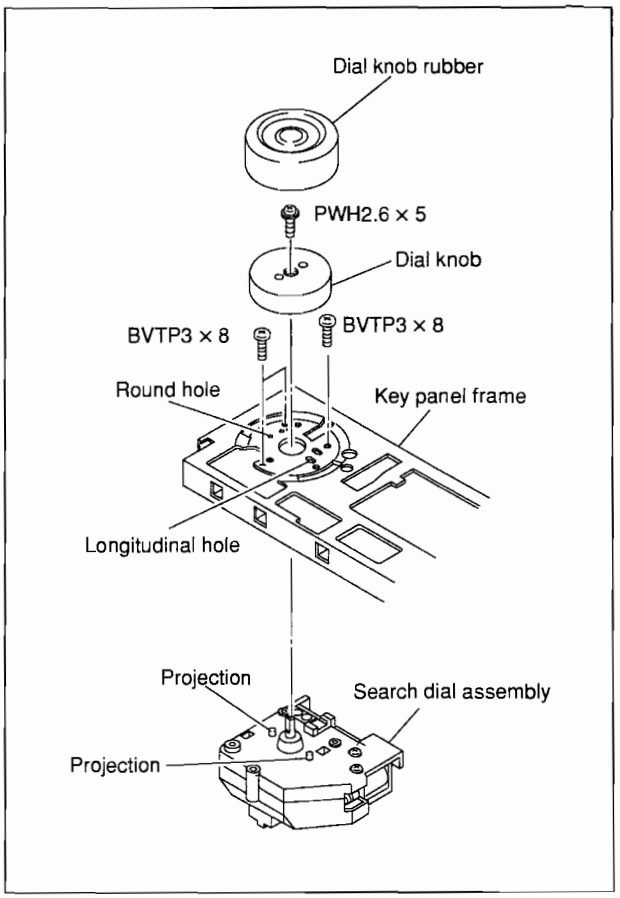
6. Confirm that no dust adheres on the panel and install the parts in the reverse order of procedures 1 to 5.

5-32. Search Dial Replacement

1. Turn the power off.
2. Remove the lower control panel assembly.
   (Refer to section 2-4 in maintenance manual part 1.)
3. Remove the six screws and remove the cover.
   (Refer to section 5-31.)
4. Disconnect the four connectors CN2, CN3, CN4 and CN7 on the CP-266B board. Disconnect the two connectors CN1 and CN2 from the search dial.
5. Remove the four screws and remove the CP-266B board.



6. Remove the seven screws and remove the AD key panel assembly.
   (Refer to section 5-31.)
7. Remove the dial knob rubber.
8. Remove the screw and remove the dial knob.
9. Remove the three screws and remove the search dial assembly.



10. Install the parts in the reverse order of procedures 1 to 9.

Note

When attaching the search dial assembly, align the two projections with round hole and longitudinal hole.

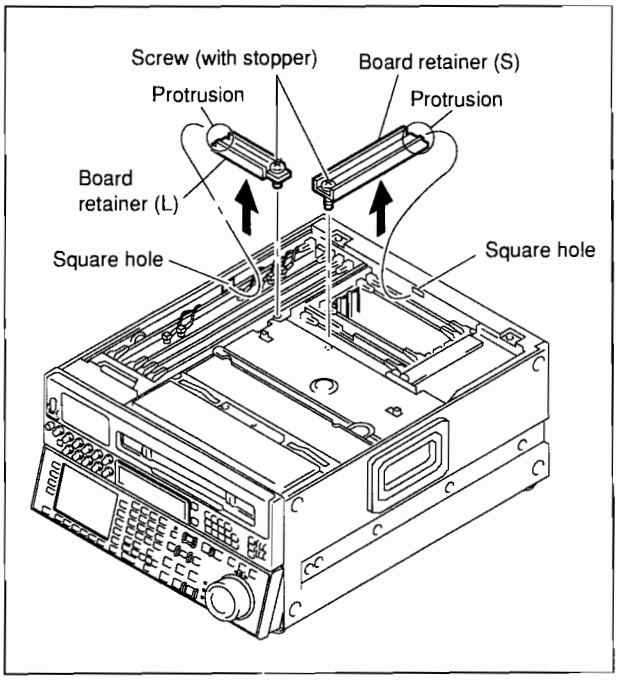
5-33. Board Replacement

5-33-1. Plug-in Board Replacement

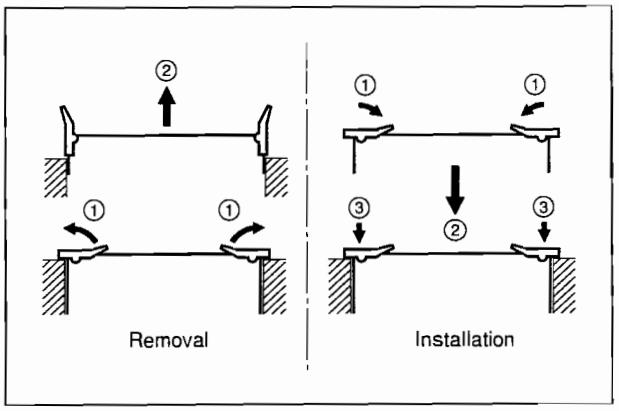
CAUTION

- Trun the power off and remove the power cable before launching servicing.

1. Remove the upper lid.
   (Refer to section 2-5-1 in maintenance manual Part 1.)
2. Loosen the screw. Remove the board retainers (L) and (S).



3. Disconnect the harnesses from the board to be removed.
   CUE-10 board : 4 harnesses
   DIF-91A board: 6 harnesses
   DCP-26 board : 3 harnesses
   EQ-85 board : 7 harnesses
   PD-94 board : 2 harnesses and 1 flat cable
4. Pull the eject levers of the board to be removed in the arrow direction.
5. Hold the eject levers and extracts the board upward gradually.



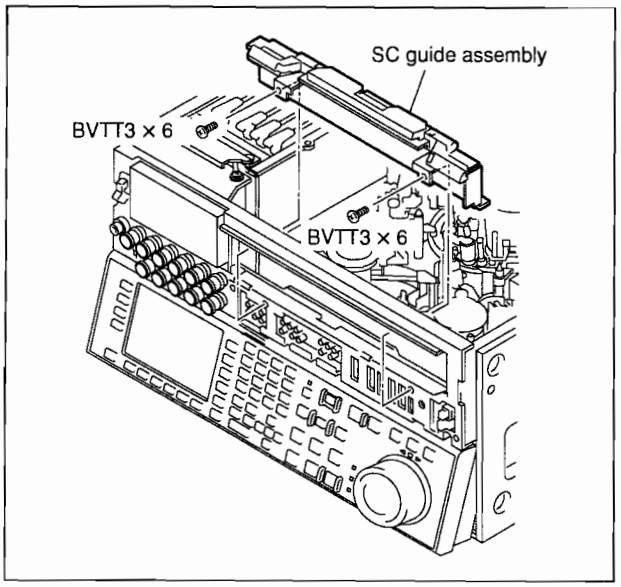
Installation should be made in the reverse procedures of removal.

Notes

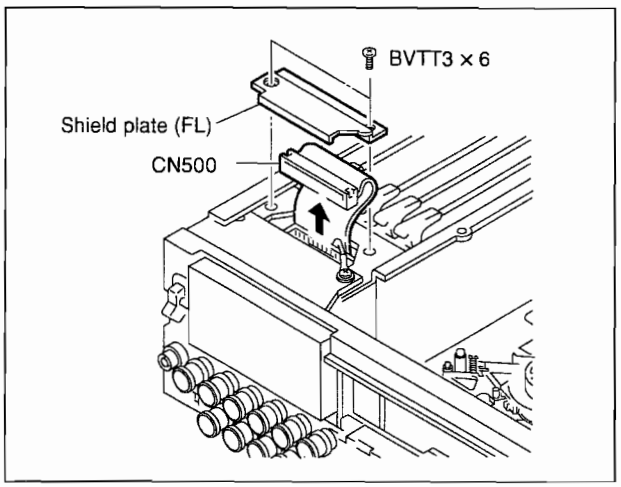
- Insert the board and push both eject levers simultaneously to connect it securely to the mother board (MB-863 board).
- When attaching the board retainer, fit the protrusion to the square hole of chassis, and tighten the fixing screw.

5-33-2. SWC-17E Board

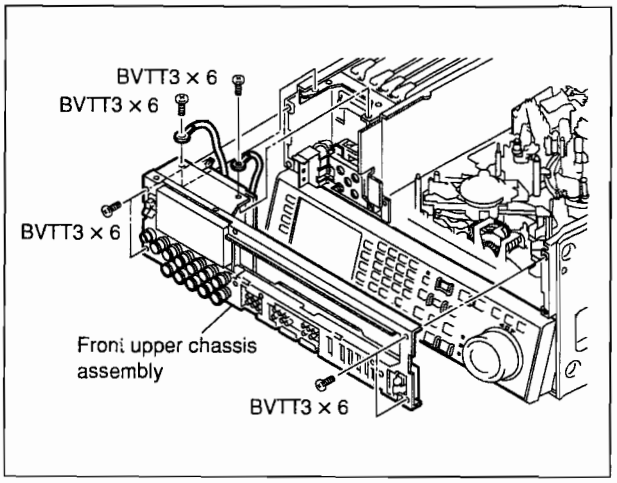
1. Turn the power off.
2. Remove the upper lid.
   (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)
5. Remove the upper control panel.
   (Refer to section 2-5-2 in maintenance manual part 1.)
6. Remove the two screws and remove the SC guide assembly.



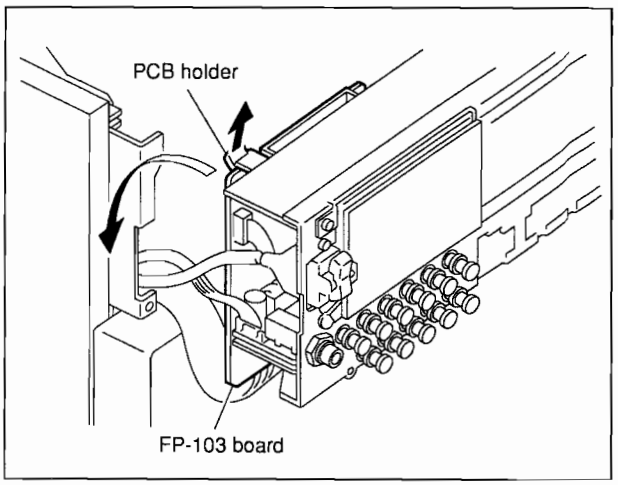
7. Remove the two screws and remove the shield plate (FL).
8. Disconnect connector CN500.



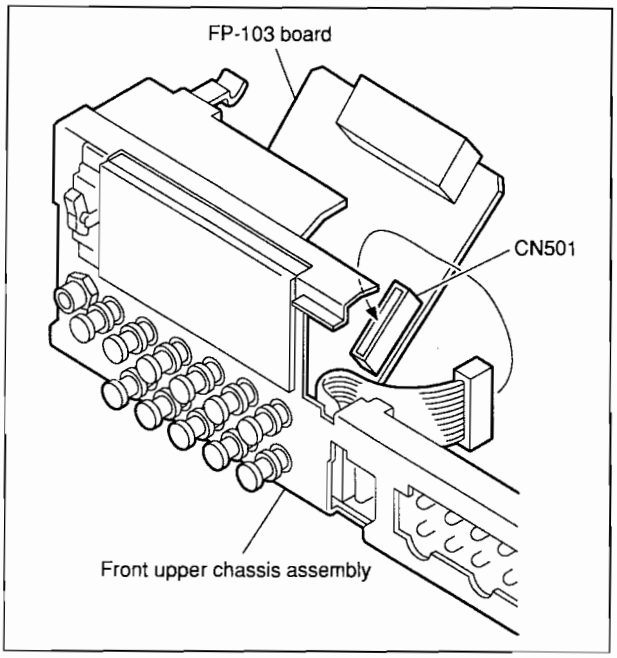
9. Remove the six screws and extract the front upper chassis assembly.



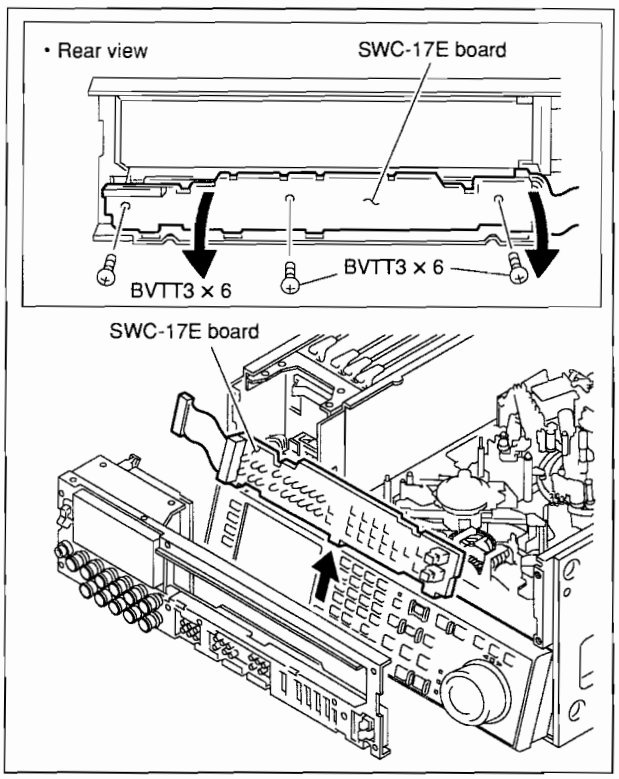
10. Remove the FP-103 board from the PCB holder and open it backward.



11. Disconnect connector CN501 on the FP-103 board.



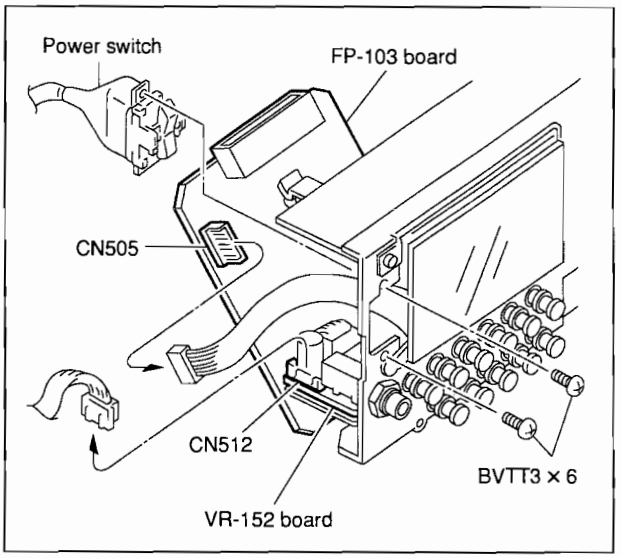
12. Remove the three screws and extract the SWC-17E board after push it down backward.



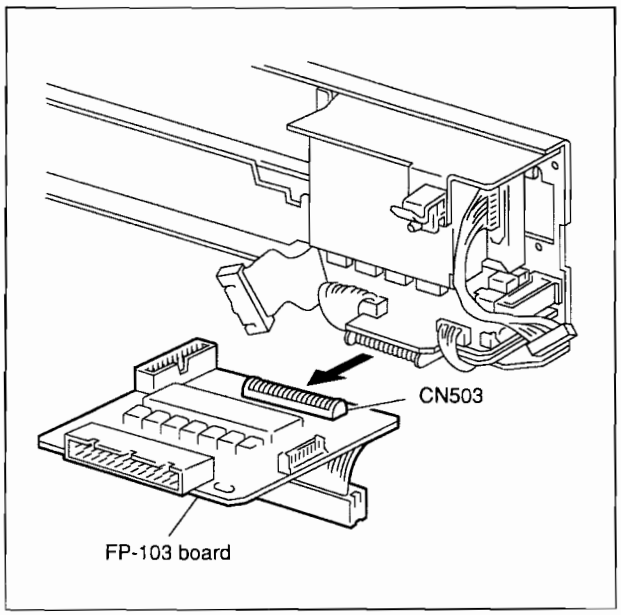
13. Install the board in the reverse order of procedures 1 to 12.

5-33-3. FP-103 Board

1. Turn the power off.
2. Remove the upper lid.
   (Refer to section 2-5-1 in maintenance manual part 1.)
3. Remove the plate MD.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove the cassette compartment assembly.
   (Refer to section 2-7 in maintenance manual part 1.)
5. Remove the upper control panel.
   (Refer to section 2-5-2 in maintenance manual part 1.)
6. Remove the two screws and remove the SC guide assembly.
   (Refer to section 5-33-2.)
7. Remove the two screws and remove the shield plate (L).
   (Refer to section 5-33-2.)
8. Disconnect connector CN500. Remove the six screws and extract the front upper chassis assembly.
   (Refer to section 5-33-2.)
9. Remove the FP-103 board from the PCB holder and open it backward.
   (Refer to section 5-33-2.)
10. Disconnect connector CN501 on the FP-103 board.
    (Refer to section 5-33-2.)
11. Remove the two screws and take the power switch out.
12. Disconnect connectors CN512 on the VR-152 board and CN505 on the FP-103 board, and remove the front upper chassis assembly.



13. Disconnect connector CN503 and remove the FP-103 board.



14. Install the board in the reverse order of procedures 1 to 13.

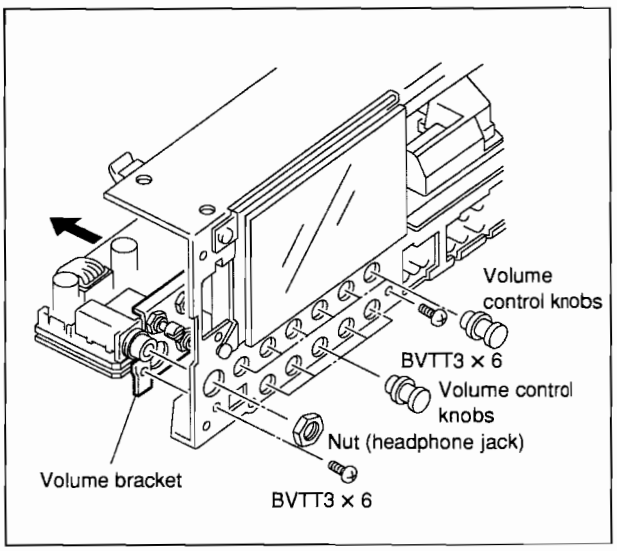
Note

When connecting connector CN503, put the protrusion of the VR-153 board's connector to the groove of CN503, and raise the FP-103 board vertically.

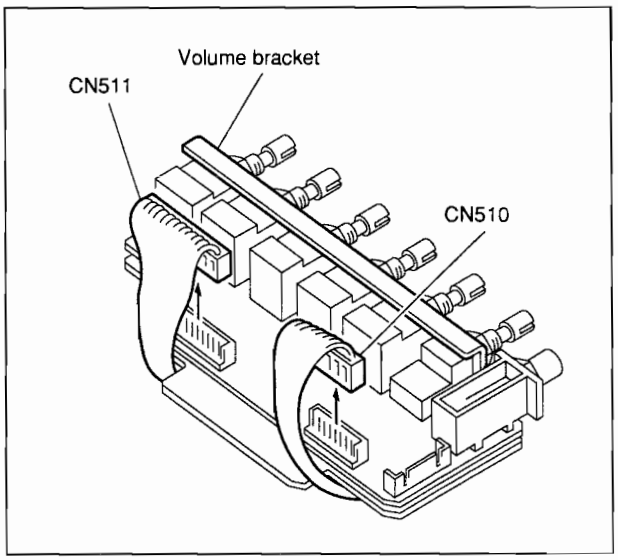
5-33-4. VR-152 Board

After replacement, perform the CUE unity level adjusment. (Refer to section 3-2-3.)

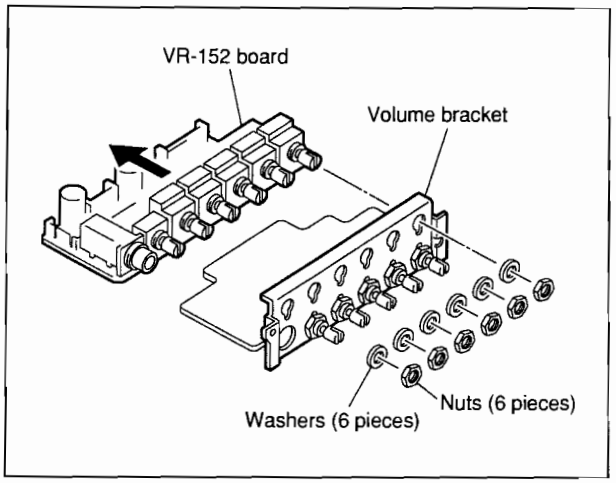
1. Remove the FP-103 board in accordance with section 5-33-3.
2. Remove the eleven volume control knobs.
3. Remove the nut from the headphone jack.
4. Remove the two screws and remove the volume bracket.



5. Disconnect the two connectors CN510 and CN511.



6. Remove the six nuts and washers, and remove the VR-152 board.



7. Install the board in the reverse order of procedures 1 to 6.

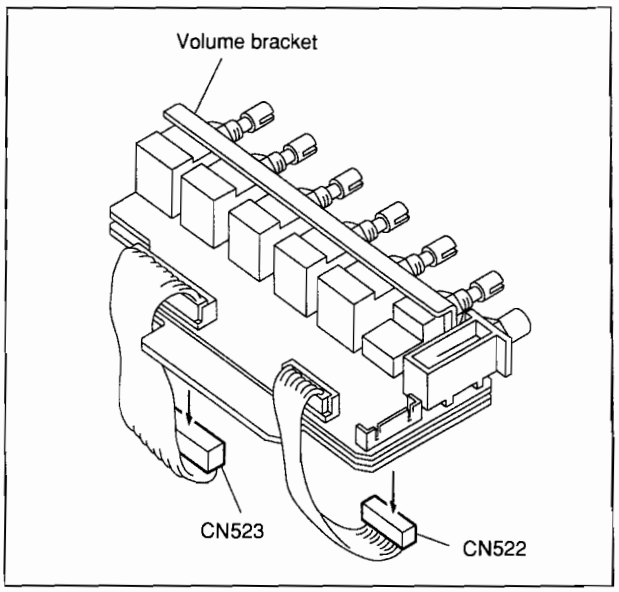
Note

Apply screw-locking compound after locking the nut.

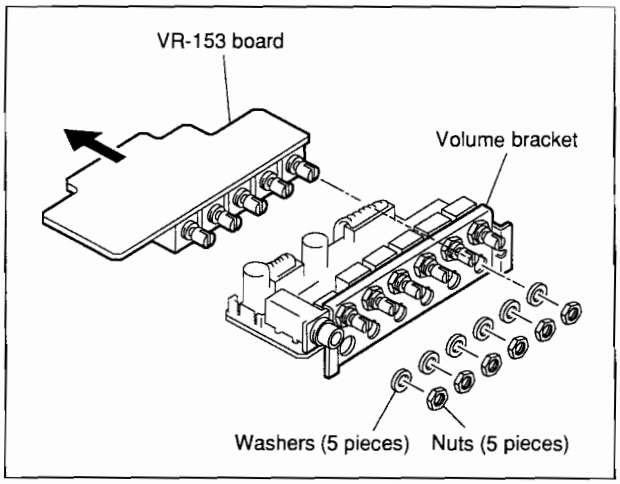
5-33-5. VR-153 Board

After replacement, perform the CUE PB level adjusment. (Refer to section 3-2-6.)

1. Remove the FP-103 board in accordance with section 5-33-3.
2. Remove the volume bracket in accordance with section 5-33-4.
3. Disconnect the two connectors CN522 and CN523.



4. Remove the five nuts and washers, and remove the VR-153 board.



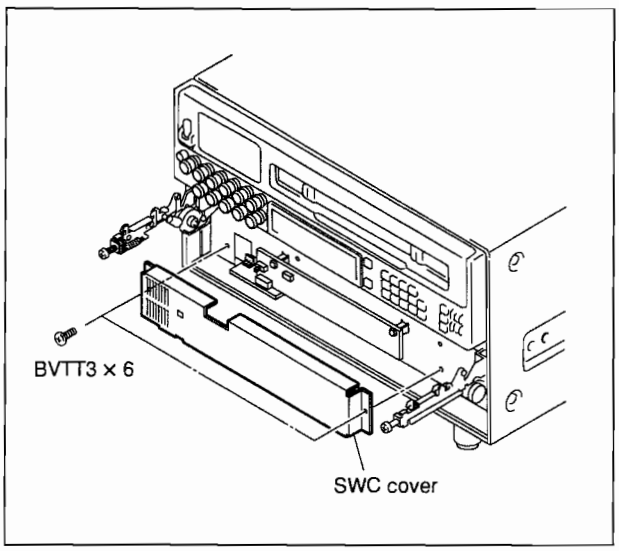
5. Install the board in the reverse order of procedures 1 to 4.

Note

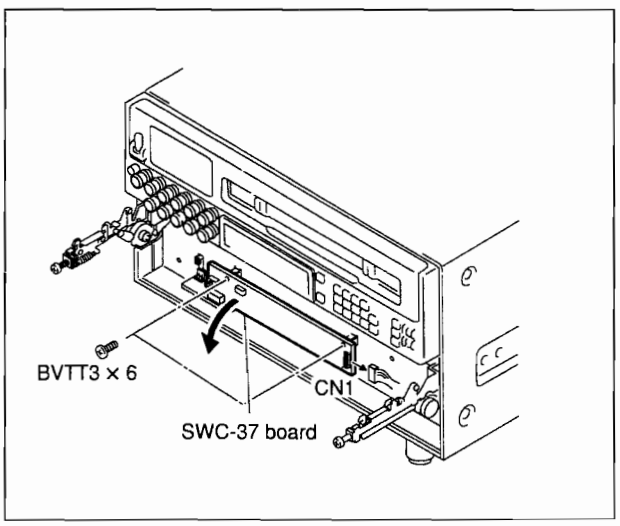
Apply screw-locking compound after locking the nut.

5-33-6. SWC-37 Board

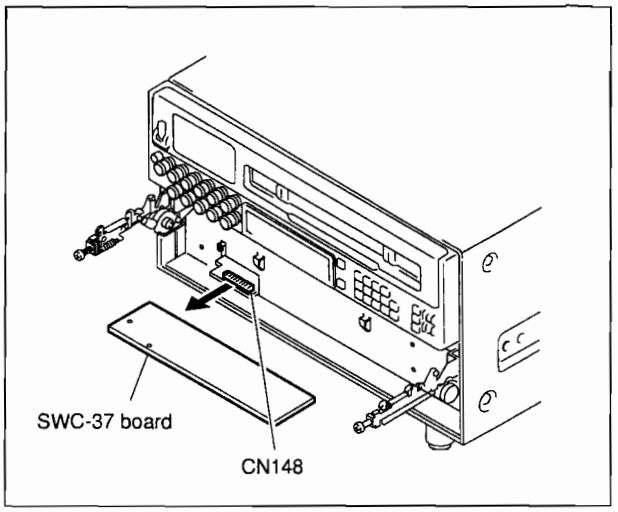
1. Turn the power off.
2. Remove the lower control panel assembly (Refer to section 2-4 in maintenance manual part 1.)
3. Remove the two screws and remove the SWC ornamental panel.



4. Disconnect the connector CN 1.
5. Remove the two screws, and open the SWC-37 board.



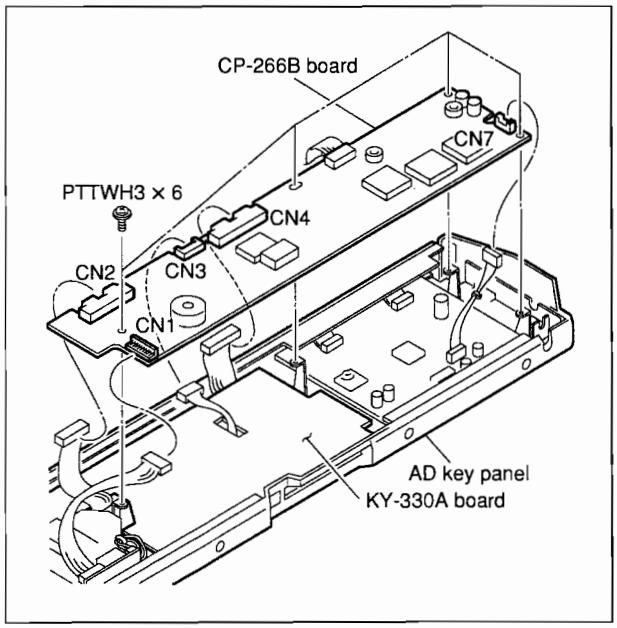
6. Remove connector CN148.



7. Install the board in the reverse order of procedures 1 to 6.

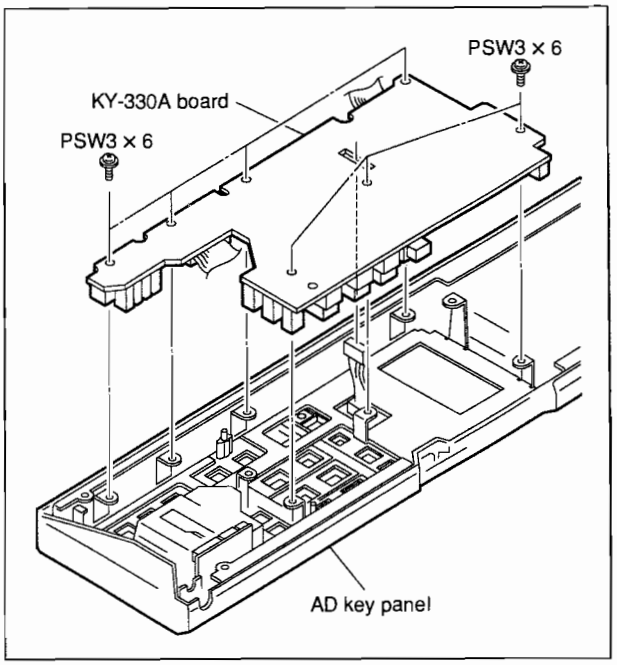
5-33-7. CP-266B Board

1. Turn the power off.
2. Remove the lower control panel assembly (Refer to section 2-4 in maintenance manual part 1.)
3. Remove the cover in accordance with section 5-31.
4. Disconnect the five connectors CN1, CN2, CN3, CN4 and CN7.
5. Remove the four screws and remove the CP-266B board.



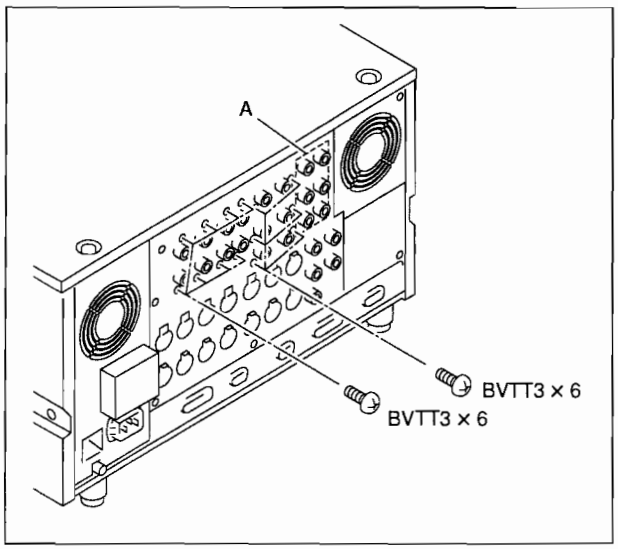
5-33-8. KY-330A Board

1. Remove the CP-266B board in accordance with section 5-33-7.
2. Remove the seven screws and remove the KY-330A board.

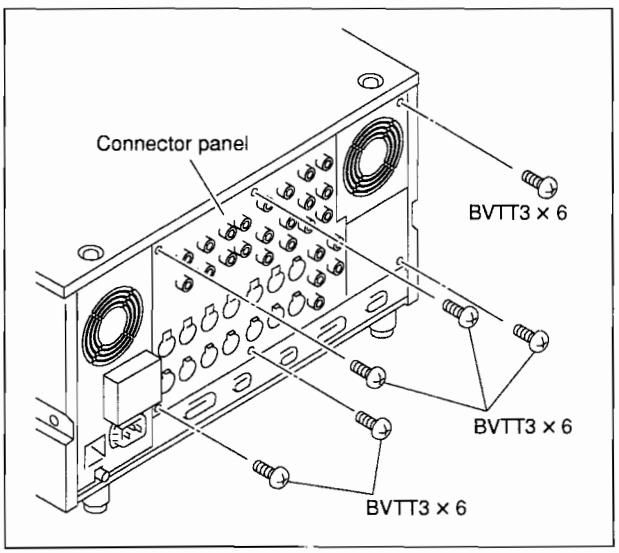


5-33-9. CP-348 Board

1. Turn the power off.
2. Remove the fourteen BNC connector fixing screws. (Be sure not to remove the six screws at portion A in the figure.)

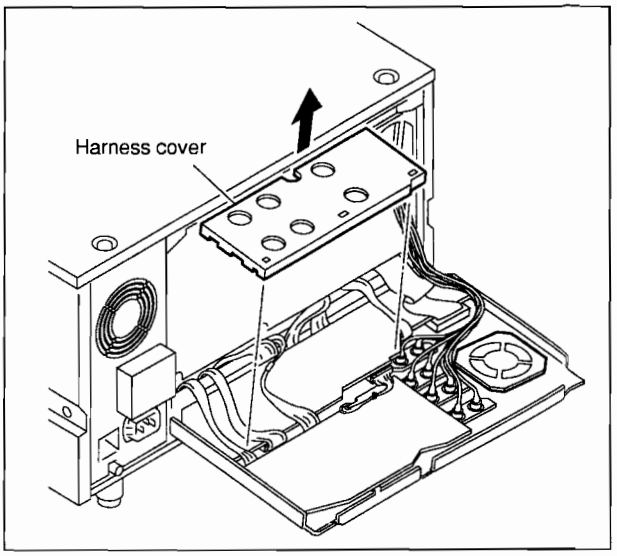


3. Remove the six ⇒ marked screws on the connector panel.



4. Open the connector panel without stretching the harness.

5. Remove the harness cover.

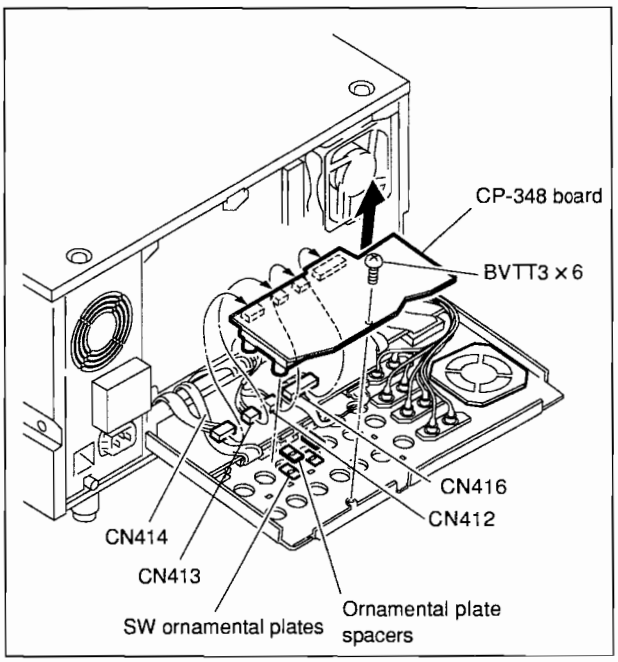


6. Remove the screw, and remove the CP-348 board.

Note

At this time, five SW ornamental plates and five ornamental plate spacers are come off. Do not lose them.

7. Disconnect four connectors (CN412, CN413, CN414 and CN416).



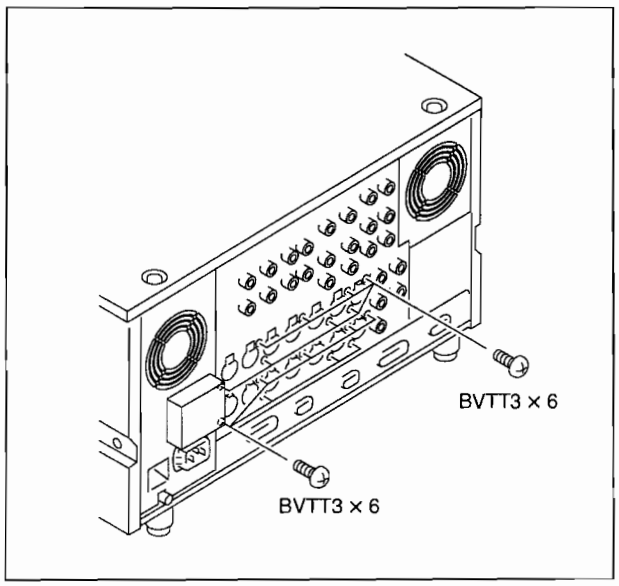
8. Install the board in the reverse order of steps 1 to 6.

Note

When installing the harness cover, exercise caution so as not to nip the harness.

5-33-10. CP-349 Board

1. Turn the power off.
2. Remove the CP-348 board,
   (Refer to section 5-33-9.)
3. Remove the 16 screws fixing the XLR connectors.

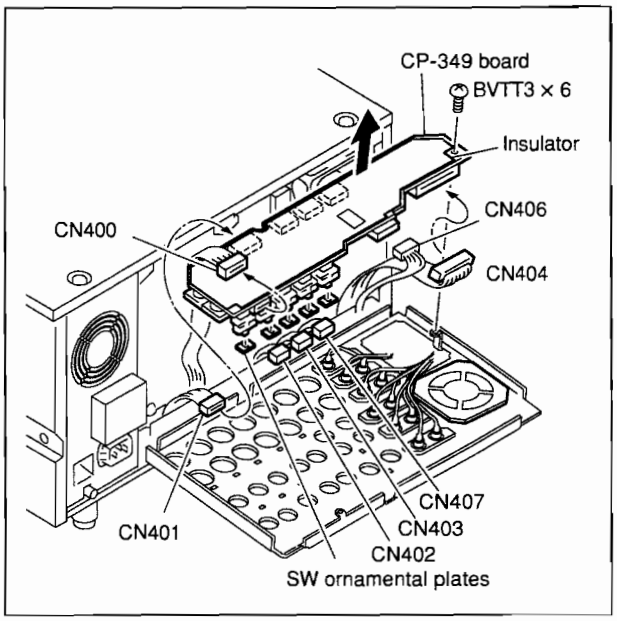


4. Remove the six screws, and open the connector panel.
   (Refer to section 5-33-9.)
5. Remove a screw, and remove the CP-349 board.

   Note

   At this time, five SW ornamental plates are come off.
   Do not lose them.

6. Disconnect seven connectors (CN400, CN401, CN402, CN403, CN404, CN406 and CN407).
7. Remove the insulator.



8. Install the board in the reverse order of steps 1 to 7.

5-33-11. DR-307 Board

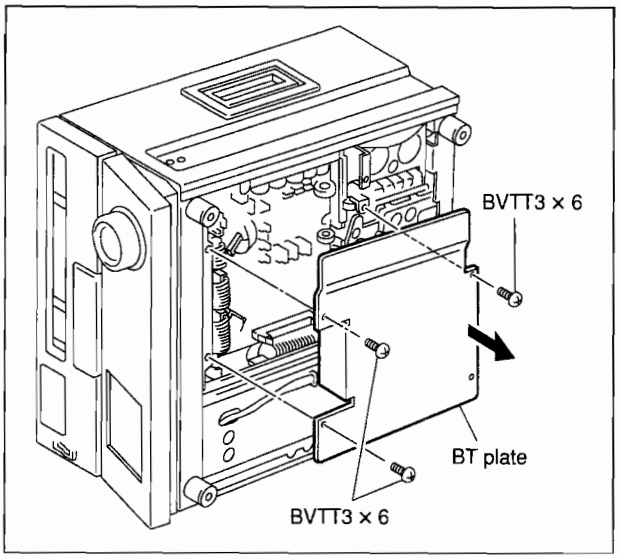
Note

Be sure to save the data inside the DR-NVRAM before replacement. After the replacement, load the saved data onto theDR-307 board. For more detail, refere to section "1-2. About NVRAM."
After the replacement, perform the servo/DT adjustment. Refer to section 4-4 in maintenance manual part 1.

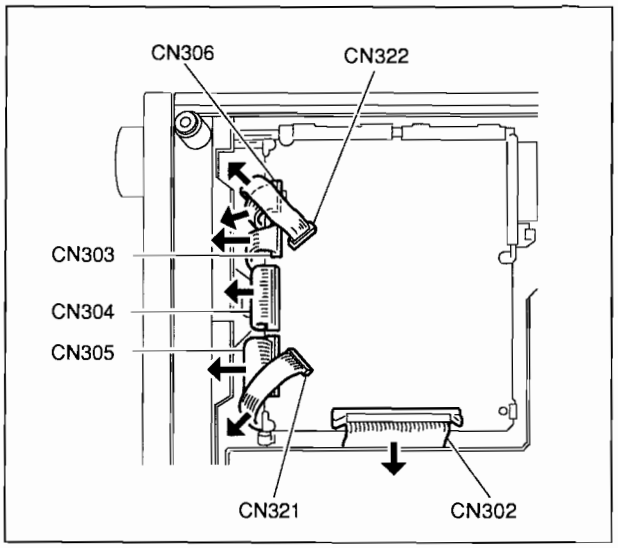
Servo
- AUTO ADJ.
- CAPSTAN SPEED
- RF SW AUTO

DT
- CAPSTAN FG LVL
- DRIVE GAIN
- HEAD OFFSET

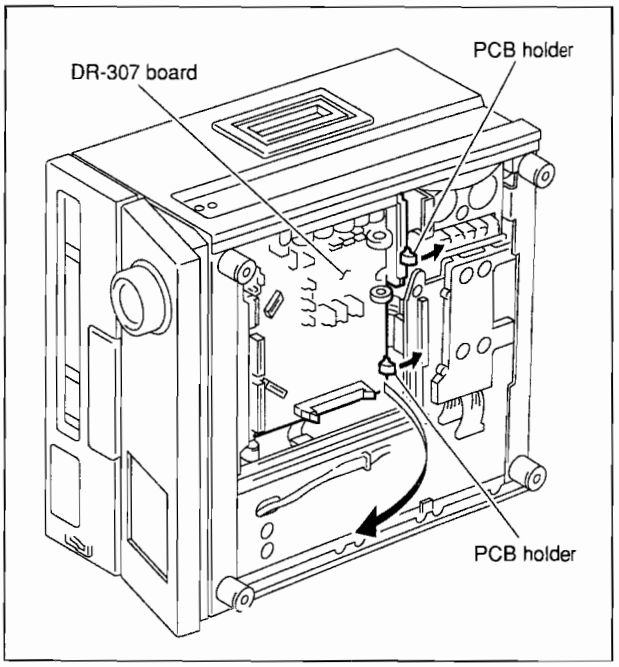
1. Turn the power off.
2. Remove the bottom plate.
   (Refer to section 2-5 in maintenance manual part 1.)
3. Remove three screws, and remove the BT plate.



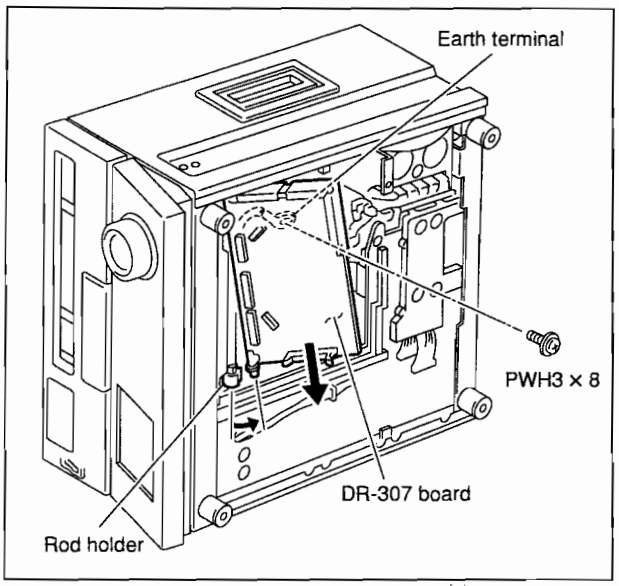
4. Disconnect seven connectors (CN302, CN303, CN304, CN305, CN306, CN321 and CN322).



5. Undo the PCB holder, and open the DR-307 board.



6. Remove one screw, then remove the earth terminal.
7. Remove the DR-307 board from the rod holder.



8. Install the board in the reverse order of steps 1 to 7.

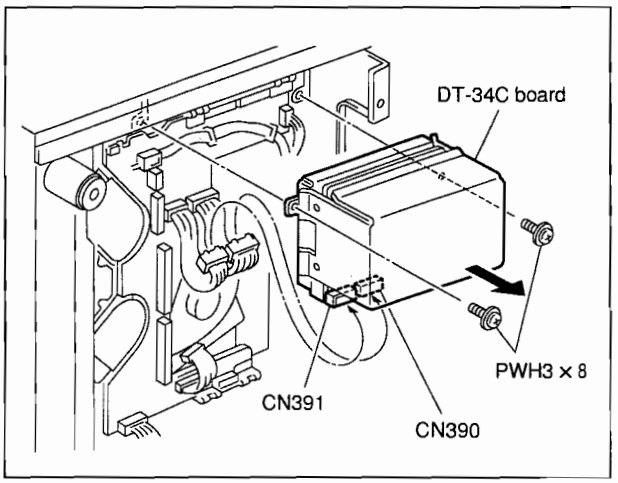
Note

Be sure to put harness inside the unit when closing the DR-307 board.

5-33-12. DT-34C Board

After replacement, perform DT adjustment.
Refer to section 4-4-2 in maintenance manual part 1.
(F 4 : DRIVE GAIN/F 5 : HEAD OFFSET)

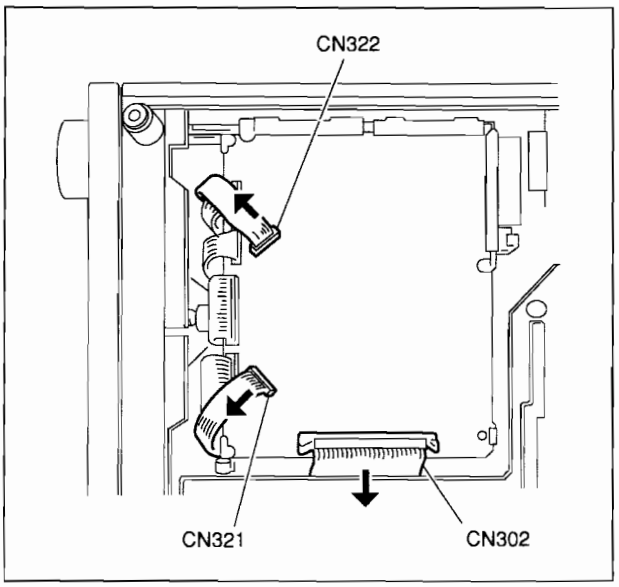
1. Turn the power off.
2. Remove the DR-307 board. (Refer to section 5-33-11.)
3. Disconnect two connectors (CN390 and CN391).
4. Remove two screws, and remove the DT-34C board.



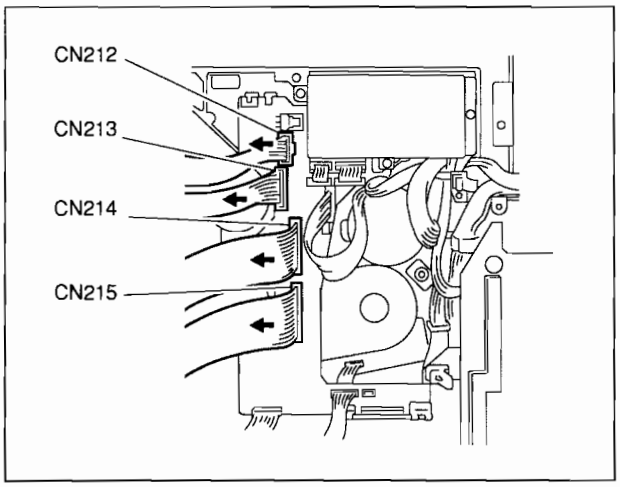
5. Install the board in the reverse order of steps 1 to 4.

5-33-13. HN-264 Board

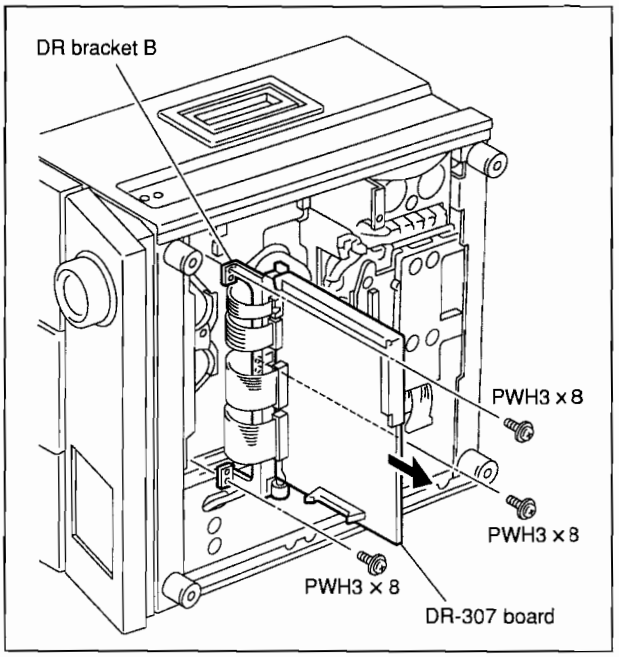
1. Turn the power off.
2. Remove the upper lid.
   (Refer to section 2-5 in maintenance manual part 1.)
3. Remove the MD plate.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Remove three screws, and remove the BT plate.
   (Refer to section 5-33-11.)
5. Disconnect three connectors (CN302, CN321 and CN322) on the DR-307 board.



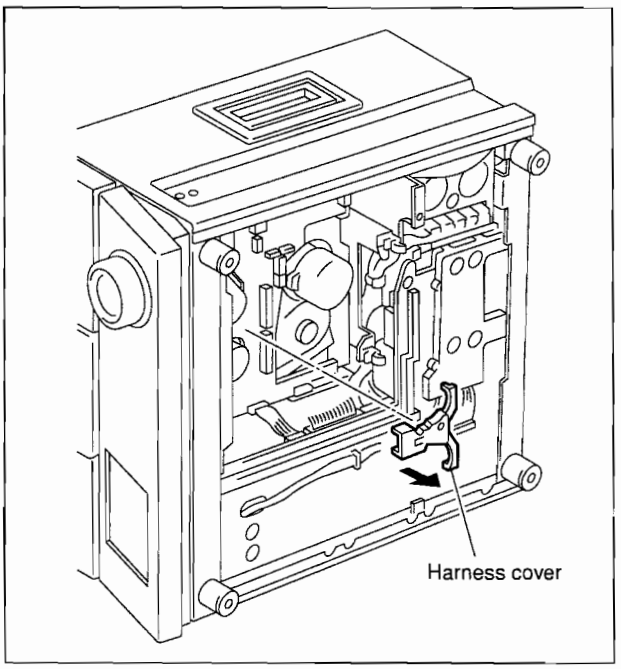
6. Undo the PCB holder, and open the DR-307 board.
   (Refer to section 5-33-11.)
7. Disconnect four connectors (CN212, CN213, CN214 and CN215) on the HN-264 board.



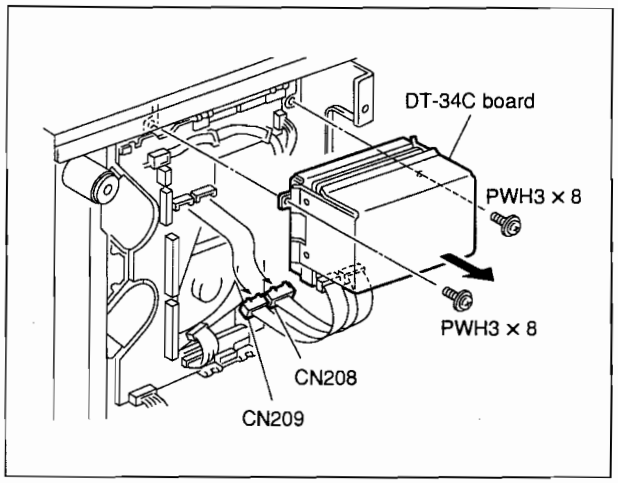
8. Remove three screws, then remove the DR bracket B and DR-307 board.



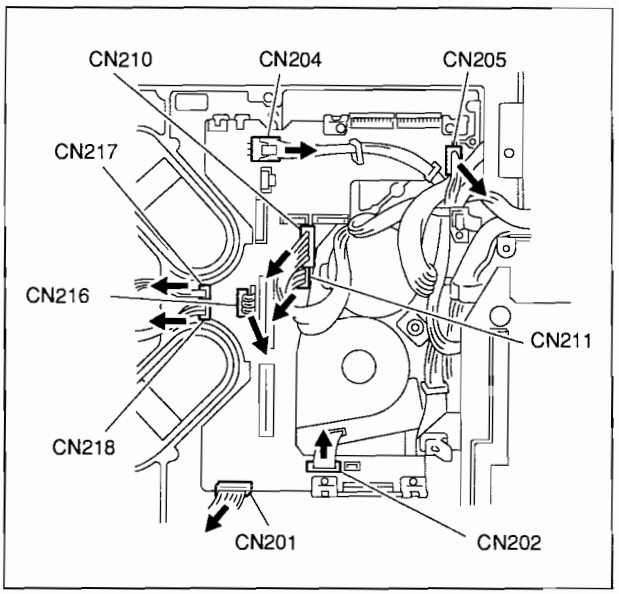
9. Remove the harness cover.



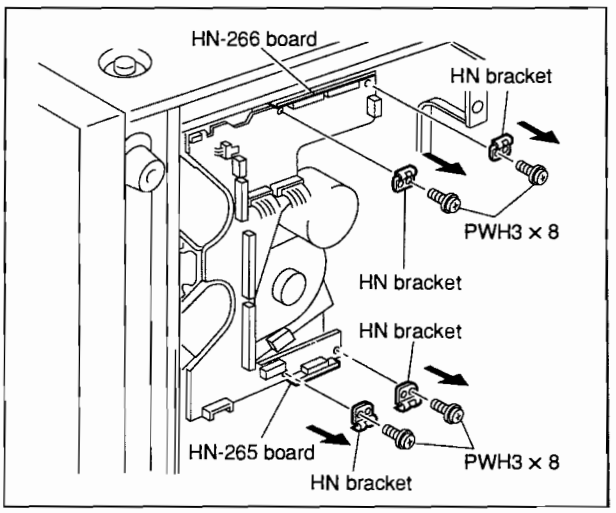
10. Remove two screws, and remove the DT-34C board, then disconnect two connectors (CN208 and CN209).



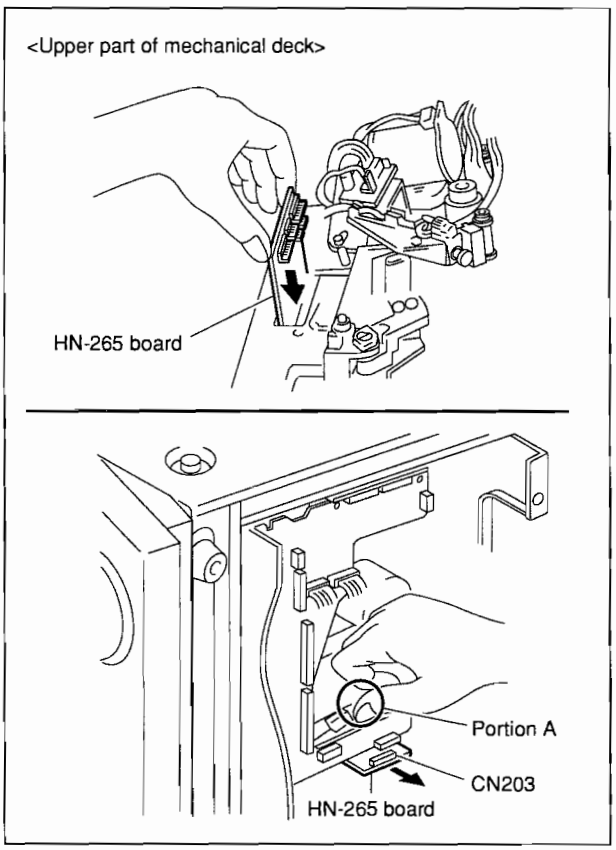
11. Disconnect nine connectors (CN201, CN202, CN204, CN205, CN210, CN211, CN216, CN217 and CN218) on the HN-264 board.



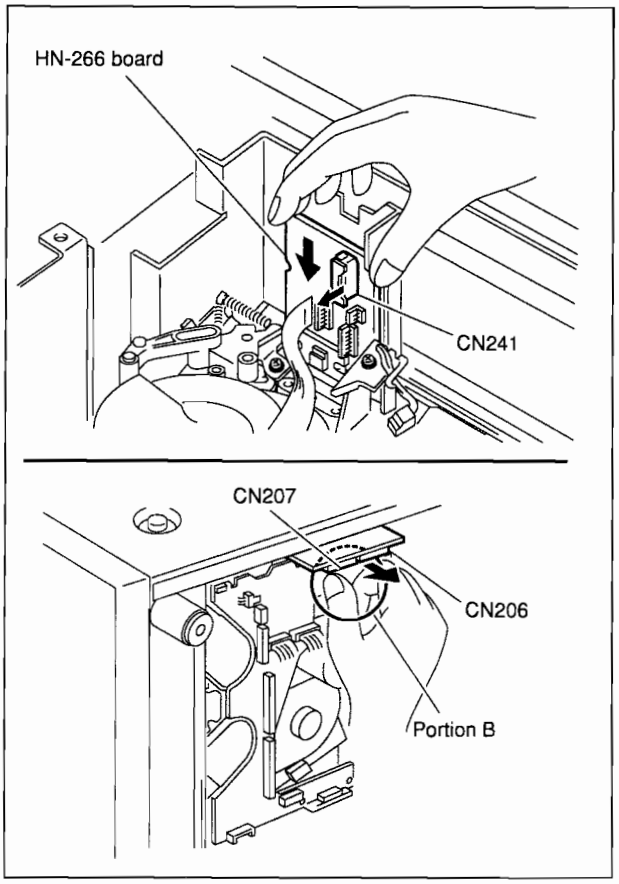
12. Remove two screws which fix the HN-265 board and HN-266 board, and remove the two HN brackets.



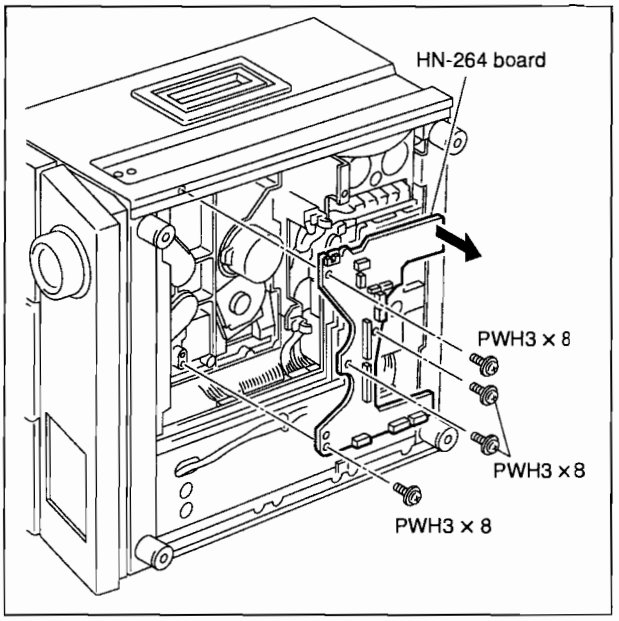
13. Disconnect connector CN203 with care while holding A portion.



14. In order to protect flexible card wire from damage, disconnect connector CN241 from the HN-266 board.
15. Disconnect two connectors CN206 and CN207 with care while holding B portion.



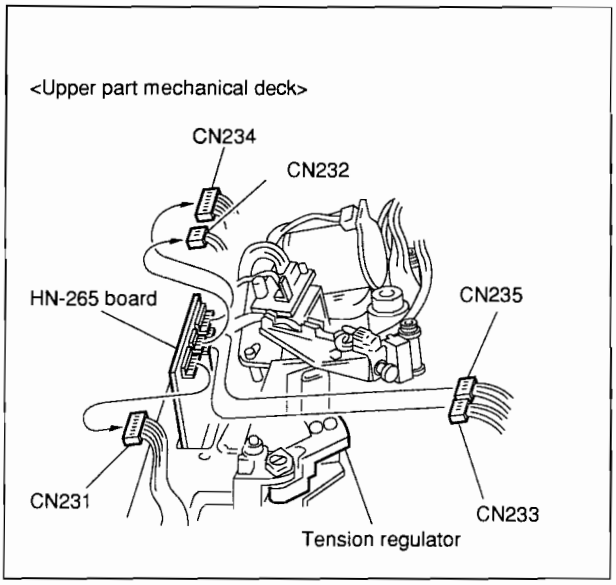
16. Remove the four screws, and remove the HN-264 board.



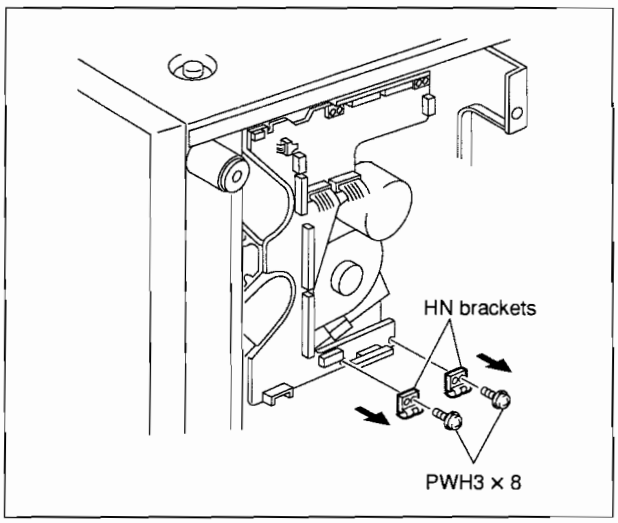
17. Install the board in the reverse order of steps 1 to 16.

5-33-14. HN-265 Board

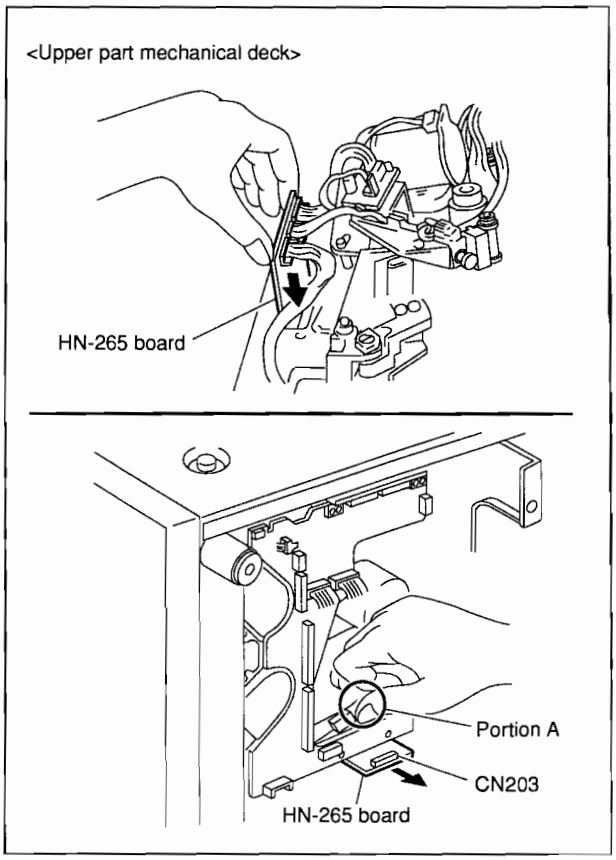
1. Turn the power off.
2. Remove the upper lid.
   (Refer to section 2-5 in maintenance manual part 1.)
3. Remove the MD plate.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Disconnect five connectors CN231, CN232, CN233, CN234 and CN235.



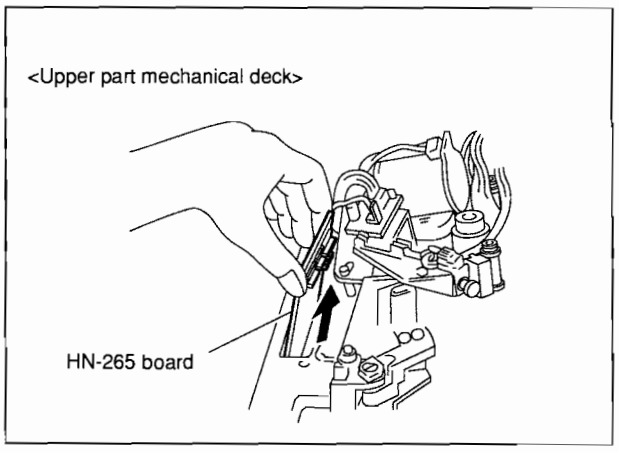
5. Remove the bottom plate. Undo the PCB holder, and open the DR-307 board.
   (Refer to section 5-33-11.)
6. Remove two screws, and remove two HN brackets.



7. Disconnect connector CN203 with care while holding A portion.



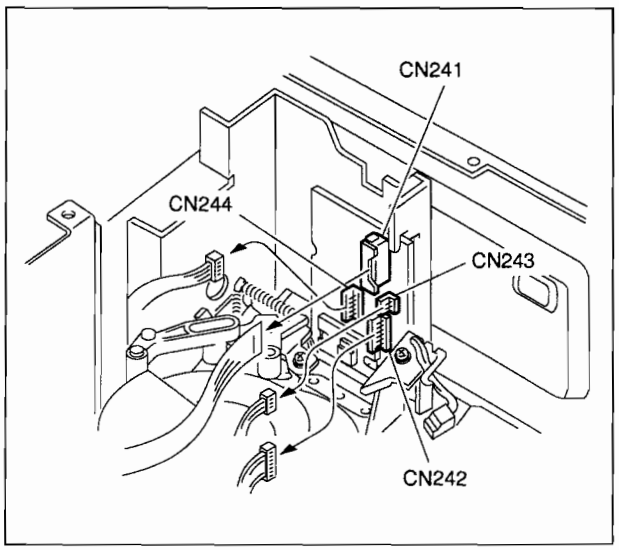
8. Tilt the HN-265 board and remove it from the mechanical deck.



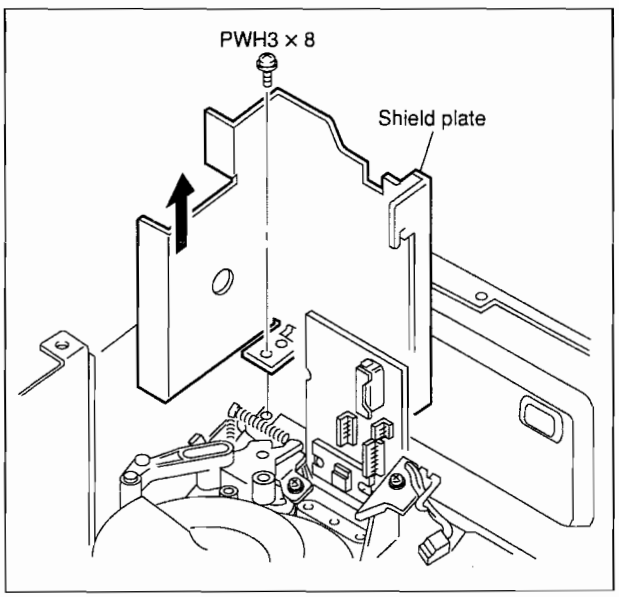
9. Install the board in the reverse order of steps 1 to 8.

5-33-15. HN-226 Board

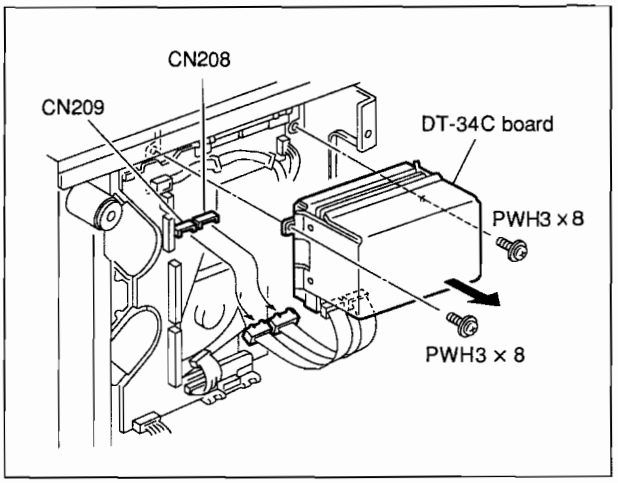
1. Turn the power off.
2. Remove the upper lid.
   (Refer to section 2-5 in maintenance manual part 1.)
3. Remove the MD plate.
   (Refer to section 2-6 in maintenance manual part 1.)
4. Disconnect four connectors CN241, CN242, CN243 and CN244.



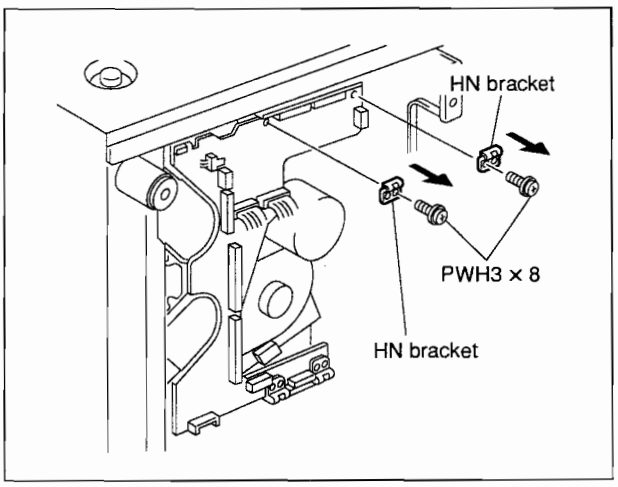
5. Remove a screw, and remove the shield plate.



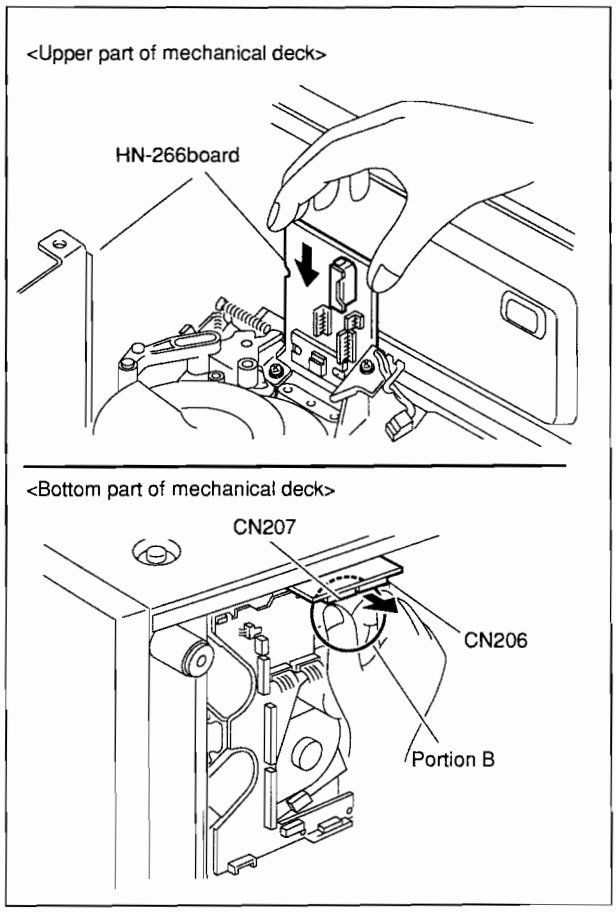
6. Undo the PCB holder and open the DR-307 board.
   (Refer to section 5-33-11.)
7. Remove two screws, and remove the DT-34C board, then disconnect two connectors CN208 and CN209.



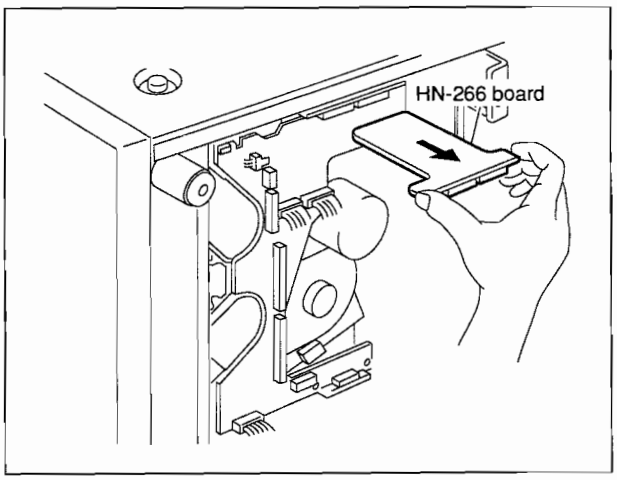
8. Remove two screws and two HN brackets.



9. Disconnect two connectors CN206 and CN207 with care while holding B portion.



10. Remove the HN-266 board.

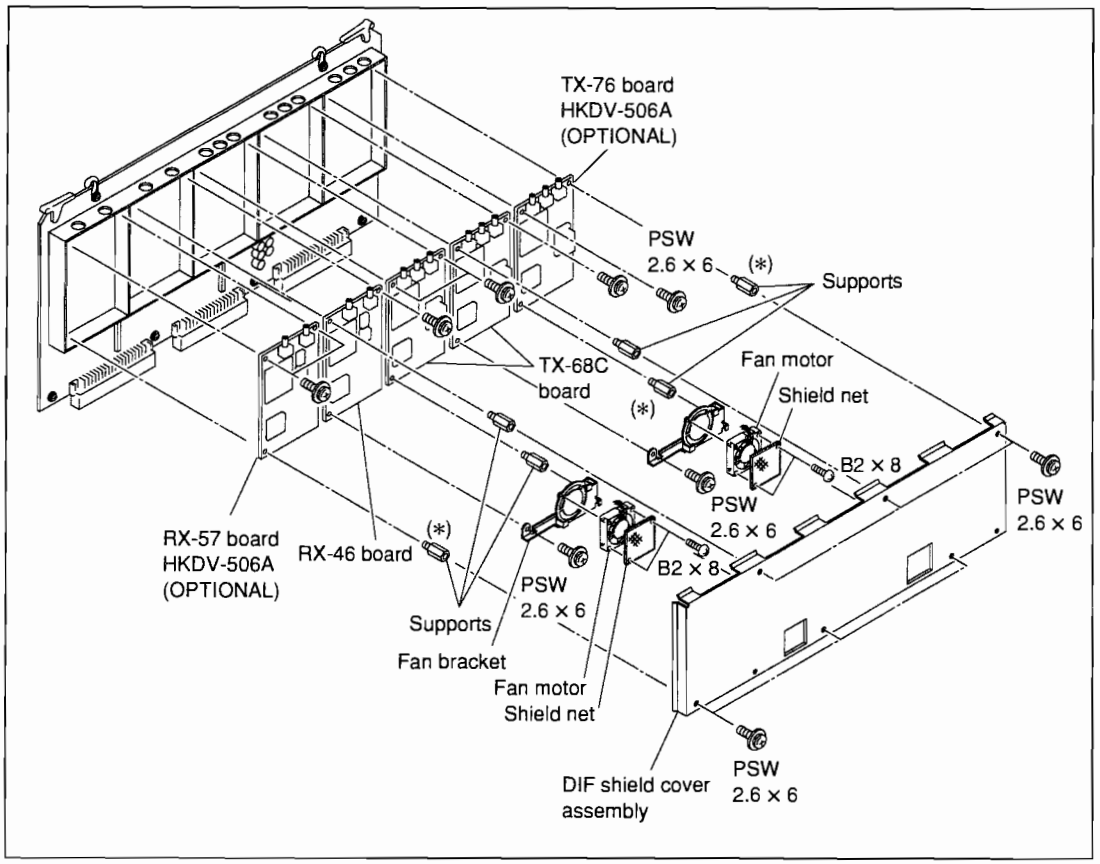


11. Install the board in the reverse order of steps 1 to 10.

5-33-16. DIF-91A Board (Plug-in Board)

The repair DIF-91A borad includes the two fan motors.

1. Turn the power off.
2. Remove the DIF-91A board from the unit.
   (Refer to section 2-10-1 in maintenance manual part 1.)
3. Remove the six screws and remove the DIF shield cover assembly.
4. Remove the six scerws and remove the two shield nets, two fan motors and two fan brackets.
5. Remove the seven screws and six supports. Remove the RX-46 board, two TX-68C boards and HKDV-506A (RX-57 board and TX-76 board).



6. Remove the six scerws from the new DIF-91A board. Remove the two shield nets, two fan motors and two fan brackets.

   Note

   Be very careful not to peel off the solder from the board by pulling the fan motor harness.

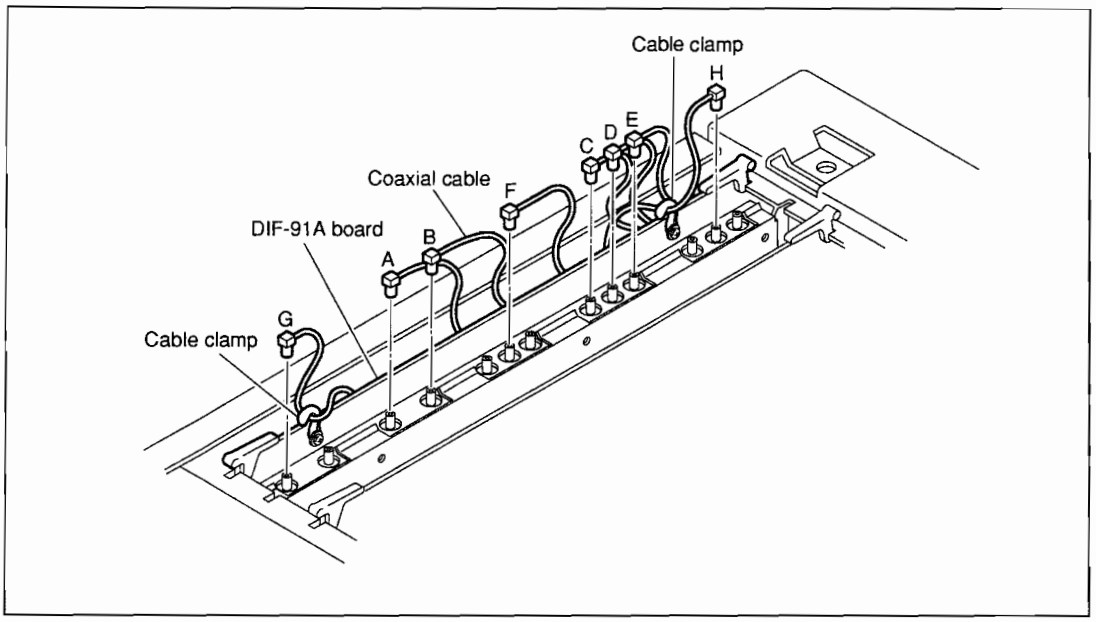
7. Attach the RX-46 board, TX-68C board, HKDV-506A and DIF shield cover assembly to the new DIF-91A board with the parts removed.

   Note

   If there is no HKDV-506A, remove the three supports marked with * as shown in the figure and three spacers (thickness : 1.6 mm) from the DIF-91A board, and attach them to the new DIF-91A board.

8. Insert the new DIF-91A board to the specified slot.

9. Connect the coaxial cabel to the DIF-91A board.



5-33-17. EQ-85 Board (Plug-in Board)

Be sure to perform RF adjustment after the replacement.
Refer to section 4-4-3. 1 in maintenance manual part 1.
(F 3 : RF ALL ADJ.)

5-33-18. CCM-33A Board

Be sure to perform CCM-33A board adjustment after the replacement.
(Refer to section 3-1-3.)

5-33-19. SE-435 Board

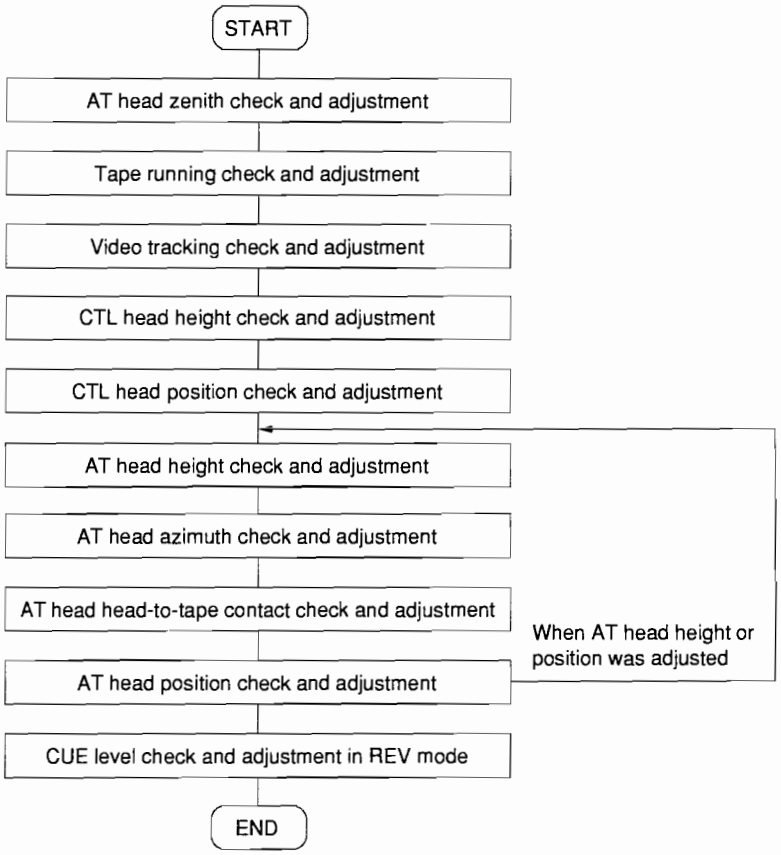
Be sure to perform CCM-33A board adjustment after the replacement.
(Refer to section 3-1-3.)

Section 6
Alignment after Replacement of Main Parts

6-1. Tape Path Adjustment

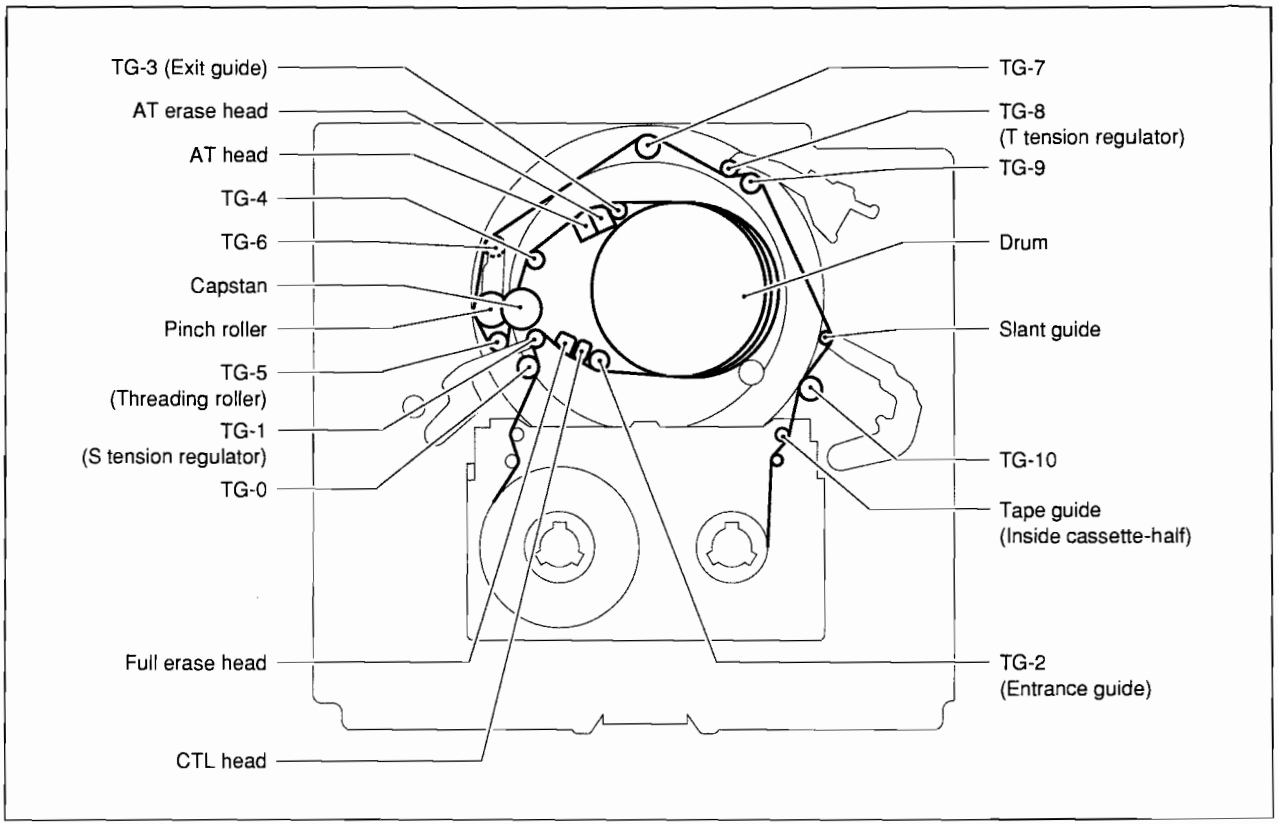
This section describes the methods of checking and adjusting the attached positions, height, and tilt of each part of the tape path system.
When tape path adjustment is performed, set the system frequency of VTR to 59.94i mode.

1. Flowchart of Tape Path Adjustment


START
AT head zenith check and adjustment
Tape running check and adjustment
Video tracking check and adjustment
CTL head height check and adjustment
CTL head position check and adjustment
AT head height check and adjustment
AT head azimuth check and adjustment
AT head head-to-tape contact check and adjustment
AT head position check and adjustment
When AT head height or position was adjusted
CUE level check and adjustment in REV mode
END

2. Parts Location of Tape Path System

The following figure shows the names of tape path parts.
The figure shows the threading end state. TG indicates the tape guide.



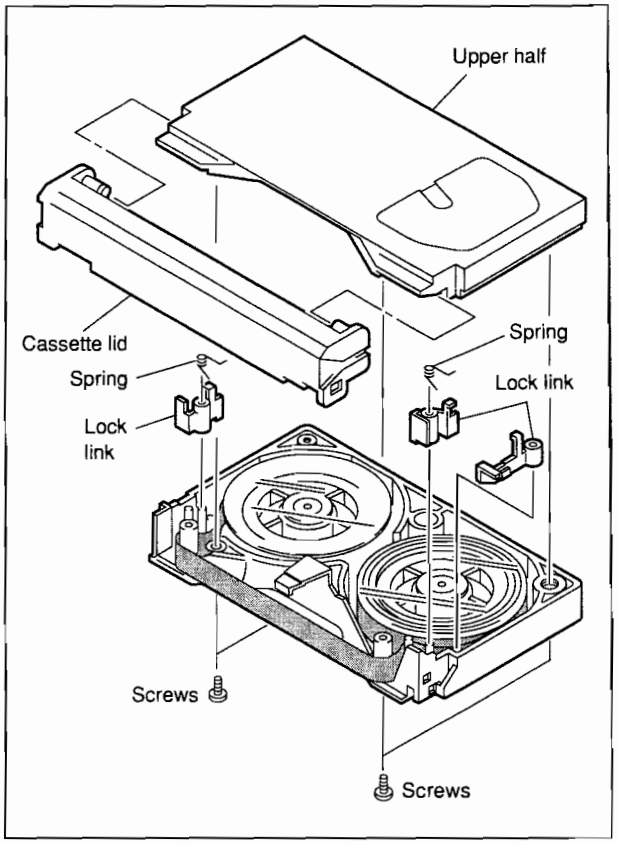
3. Cassette Compartment

(1) Tape path adjustment must be performed with the cassette compartment removed from the unit, or checks and adjustments may not be possible in some cases.
(2) When tape path adjustment is performed with the cassette compartment removed, the tape protection circuit is activated and the ERROR message may be displayed. In this case, turn the power off and turn it on again.

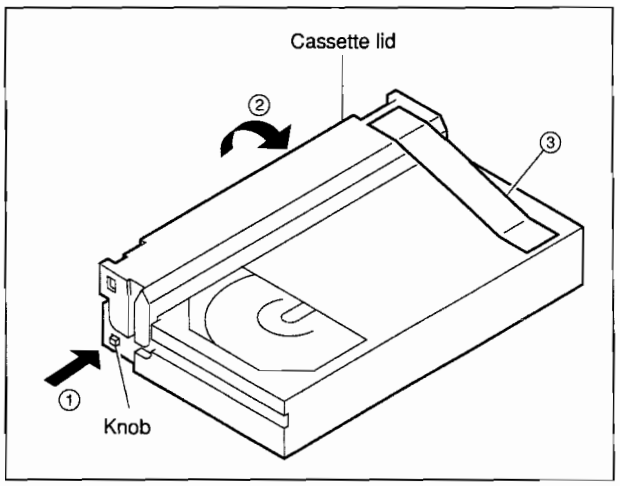
4. Cassette Tape

As tape path adjustment is performed with the cassette compartment removed, remodel the cassette tape or alignment tape used for the adjustment as shown in (1) or (2) below.

(1) Coverless cassette tape
Disassemble the cassette-half, and remove the cassette lid, springs and lock links shown in the figure.



(2) Cassette tape with lid
While pressing the ① knob in the arrow direction, open the ② cassette lid, and secure the cassette lid with ③ adhesive tape.



When setting the cassette tape or alignment tape, fit to the cassette support on the mechanical deck. To prevent the cassette from rising up, place a weight on the cassette-half. Use an approximately 1000 g weight.

5. Tracking Control

Perform the tracking control during VTR playback as follows.
(1) Set the cassette tape.
(2) Press the PLAY button to play the tape.
(3) Press the S1000 switch on the SS-88 board for more than 1 second.
In this state, the variable resistor RV1000 of the SS-88 board becomes the tracking control volume (LED : D1011 lights up).
After adjusting, press the S1000 switch on the SS-88 board for more than 1 second to fix the tracking (LED : D1011 lights out). Be sure to return to the fixed mode by turning the power OFF and then ON.

6. Preparations

(1) Remove the cassette compartment.
(Refer to Section 2-7 in Maintenance Manual Part 1.)
(2) Remove the video head cleaner assembly. (Refer to Section 5-6.)

Note

As it may be difficult to check the tape running state with the video head cleaner assembly attached in some cases, remove this assembly.

(3) Clean the following portions.
- Video head and upper drum tape running surface
(Refer to Sections 5-2-3 and 5-2-4 in Maintenance Manual Part 1.)
- Lower drum tape running surface and lead
(Refer to Section 5-2-5 in Maintenance Manual Part 1.)
- Stationary head (Refer to Section 5-2-6 in Maintenance Manual Part 1.)
- Tape running system and tape cleaner
(Refer to Section 5-2-7 in Maintenance Manual Part 1.)

7. Alignment Tape

(1) HR2-1A (For Tracking Adjustment)

Part number : 8-960-076-11

Contents

<table>
<tr><th>Time
min. : sec.</th><th>CTL Track</th><th>CUE Track</th><th>Video/Audio Track</th><th>Use</th></tr>
<tr><td>00 : 00
↑

(CTL Pulse)

↓
15 : 00</td><td>CTL</td><td>1 kHz 0 VU</td><td>5.875 MHz
(A ch only)</td><td>• Video tracking adjustment
• CTL head position adjustment
• AT head height adjustment
• AT head position adjustment
• CUE level check
• RF switching position adjustment</td></tr>
<tr><td></td><td></td><td>12 kHz 0 VU</td><td>A, C ch –5.875 MHz</td><td>• AT head slantness adjustment
• AT head/head-to-tape contact force adjustment</td></tr>
<tr><td>20 : 00</td><td></td><td></td><td>A, C ch
First half : 5.875 MHz
Latter half : 23.5 MHz

B, D ch
First half : 23.5 MHz
Latter half : 5.875 MHz</td><td></td></tr>
<tr><td>25 : 00</td><td></td><td></td><td>23.5 MHz
(All ch)</td><td></td></tr>
<tr><td>30 : 00</td><td></td><td></td><td></td><td></td></tr>
</table>

* The CTL head height can be adjusted by playing any part.
* As the area from 00 : 00 to 15 : 00 is not recorded with the time code, the CTL compensated time will be displayed.

(2) HR5-1A (Digital Video, Audio System Adjustment)

Part number : 8-960-076-01

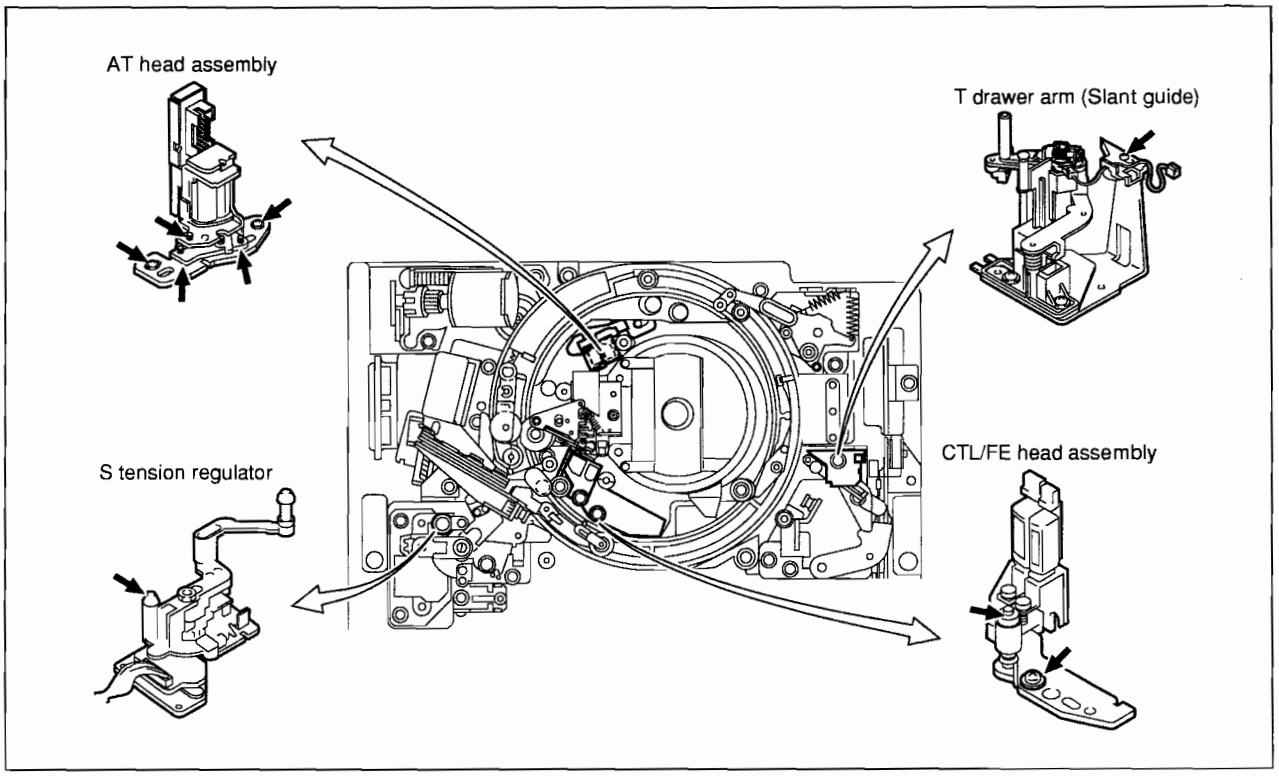
Contents

Time min. : sec.	CTL	VIDEO	D-AUDIO	CUE	Time min. : sec.
00 : 00	CTL	Color Bars (100 %)	1 kHz –20 dB FS	1 kHz 0 VU	00 : 00
				Blank	01 : 25
				1 kHz –20 VU	01 : 30
02 : 00			1 kHz 0 dB FS	Blank	02: 25
				3 kHz –20 VU	02 : 30
				Blank	02 : 55
				7 kHz –20 VU	03 : 00
				Blank	03 : 25
				10 kHz –20 VU	03 : 30
				Blank	03 : 55
04 : 00			–∞ dB FS	12 kHz –20 VU	04 : 00
				Blank	04 : 25
				90 Hz –20 VU	04 : 30
				Blank	04 : 55
				Repeat	05 : 00
06 : 00			20 Hz –20 dB FS		
08 : 00			20 kHz –20 dB FS		
10 : 00		Ramp	Repeat	Repeat	10 : 00
20 : 00		Multi Burst	—	—	20 : 00
30 : 00					30 : 00

8. Screw-Locking Compound

When loosening the following screws, apply screw-locking compound to the screws after completing the adjustment.
Be sure to wipe off the excess screw-locking compound with cloth such as gauze.

• Screw-locking compound : 7-432-114-11



6-1-1. AT Head Zenith Check and Adjustment

Note

The AT head zenith check and adjustment need only be performed when the AT head has been replaced.

Tools

- Flatness plate (SL-657) : J-6086-570-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Check

1. Unthreading End Mode

Check that the unit is in the unthreading end mode.

2. Check the AT Head Zenith

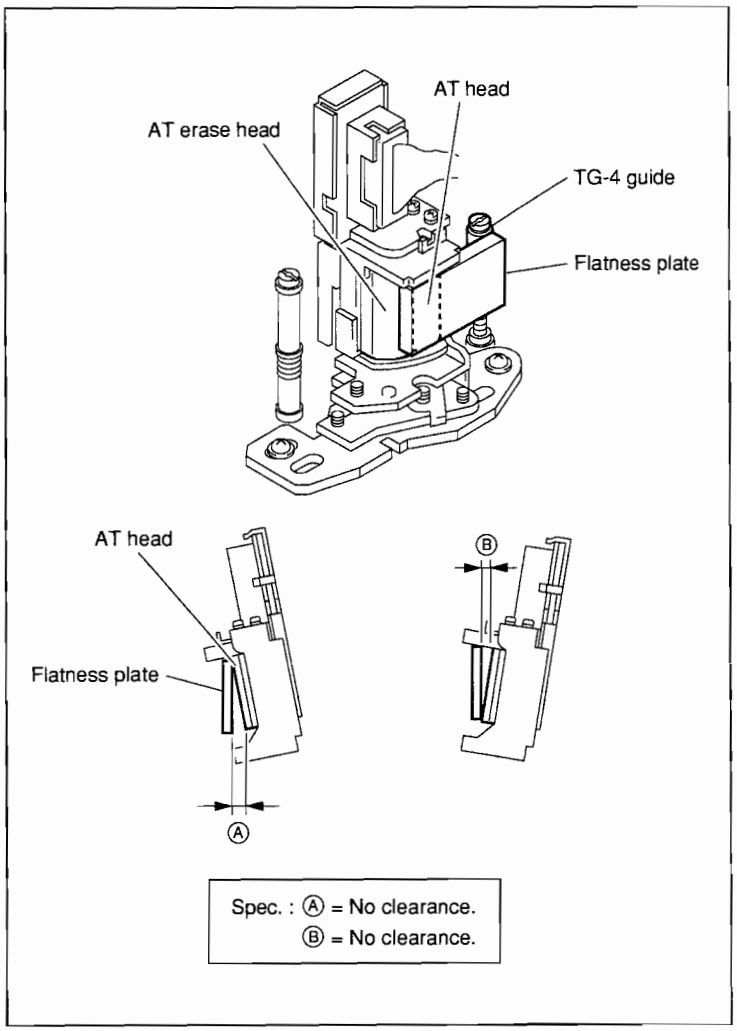
(1) Push the flatness plate lightly against the TG-4 guide and AT head.

Note

Be careful not to damage the surface of the AT head and TG-4 guide.

(2) With the state described in (1), check that no clearance exists between the AT head and flatness plate with the TG-4 guide as the reference.

If the specification is not met, perform from steps 3 onwards.
If it is met, perform step 7.



AT Head Zenith Check

Adjustment

3. Remove the CL Guide Rail

Remove the two screws, and then remove the CL guide rail.

4. If Clearance Exists at the Upper Part (Fig. 1)

Turn the zenith adjustment screw counterclockwise to meet the specification.

5. If Clearance Exists at the Lower Part (Fig. 2)

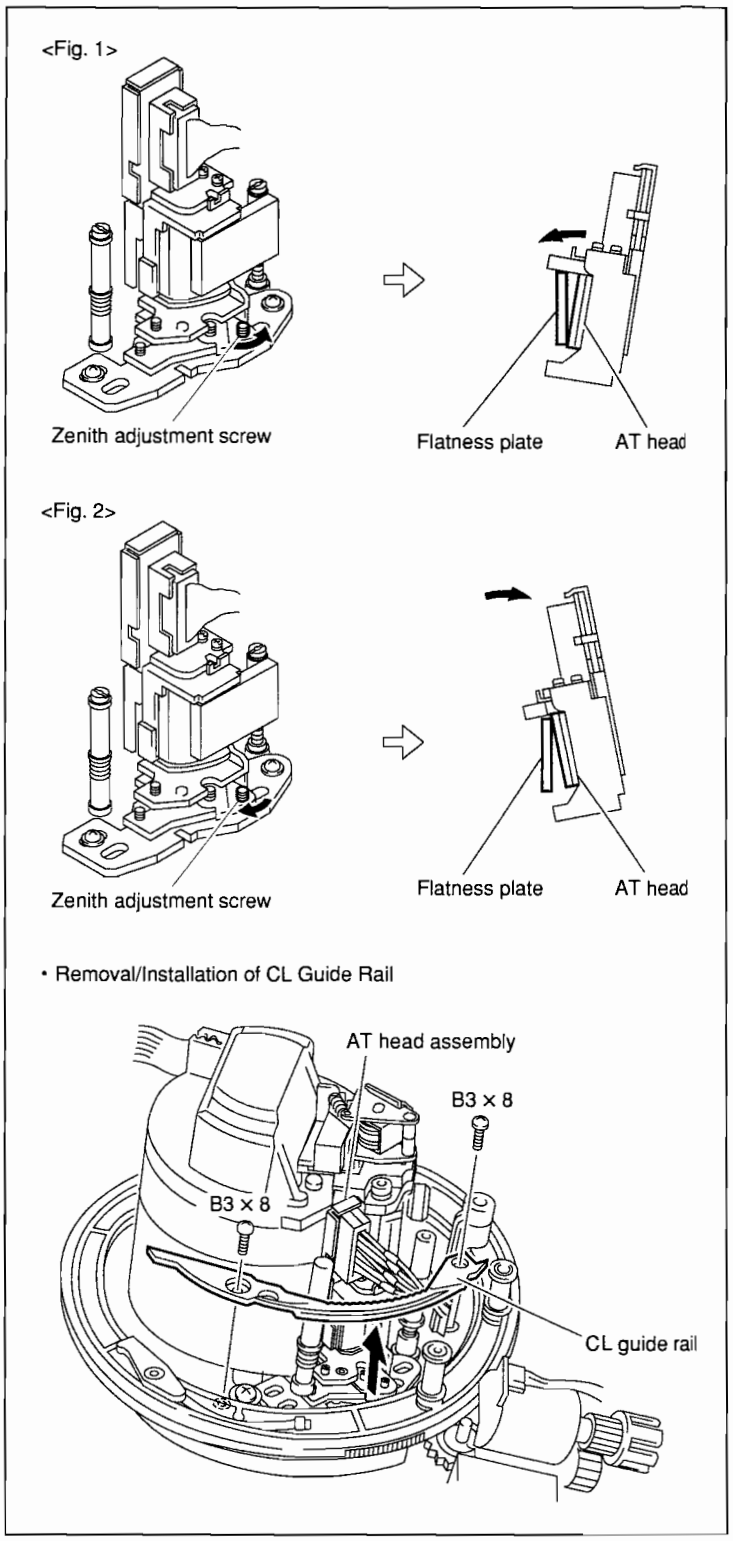
Turn the zenith adjustment screw clockwise to meet the specification.

6. Install the CL Guide Rail

Install the CL guide rail with two screws.

7. Cleaning

Clean the surfaces of the AT head, AT erase head, and TG-4 guide with a cleaning cloth moistened with cleaning fluid.



AT Head Zenith Adjustment

6-1-2. Tape Running Check and Adjustment

Note

Tape running is closely related to the heights of the S reel table and T reel table. Before performing tape running adjustment, check the heights of the S reel table and T reel table (Refer to Section 5-14-1.)

Drum Entrance Side

Tools

- HDCAM cassette (S cassette) : BCT-40HD
- Adjustment mirror (Round) : J-6080-029A
- Tape guide adjustment driver (MW-261) : J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the reel table in the S cassette position. (Refer to Section 5-1-4.)
(2) Set the S cassette and place the weight on it so that it does not rise up. (Use an approximately 1000 g weight.)

2. Turn the Power ON

3. PLAY mode

Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.

4. REV × 10 mode

Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.

5. F.FWD mode

Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.

6. REW mode

Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.

7. REV × 1 mode

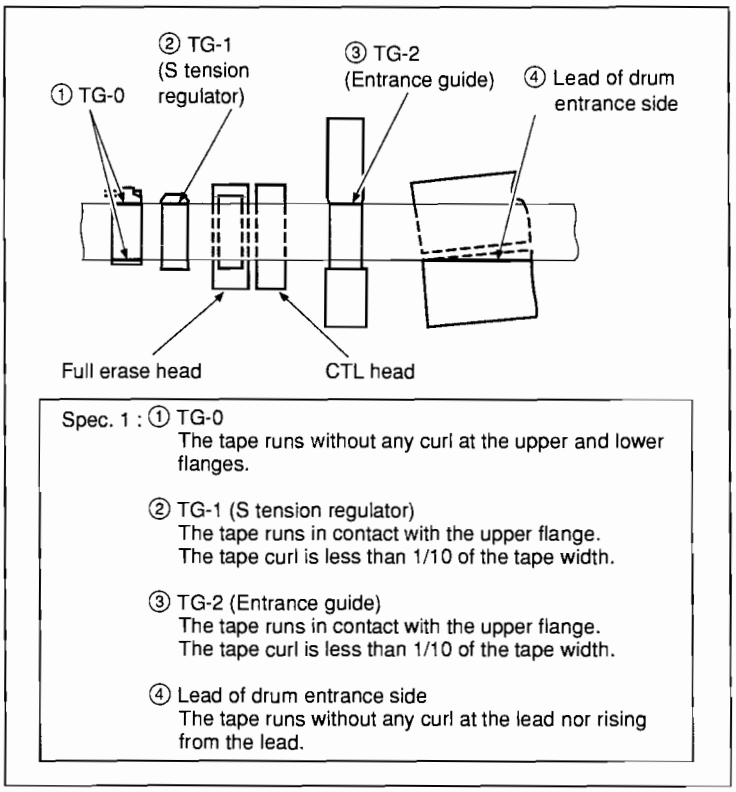
Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.

8. VAR × −1/30 mode

Check that the tape running condition meet the specification 1.

If it does not, perform steps 9 and 10.


② TG-1
(S tension
regulator)
③ TG-2
(Entrance guide)
④ Lead of drum
entrance side
① TG-0
Full erase head
CTL head
Spec. 1 : ① TG-0
The tape runs without any curl at the upper and lower flanges.
② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
④ Lead of drum entrance side
The tape runs without any curl at the lead nor rising from the lead.

Tape Running Check at Drum Entrance Side

Adjustment

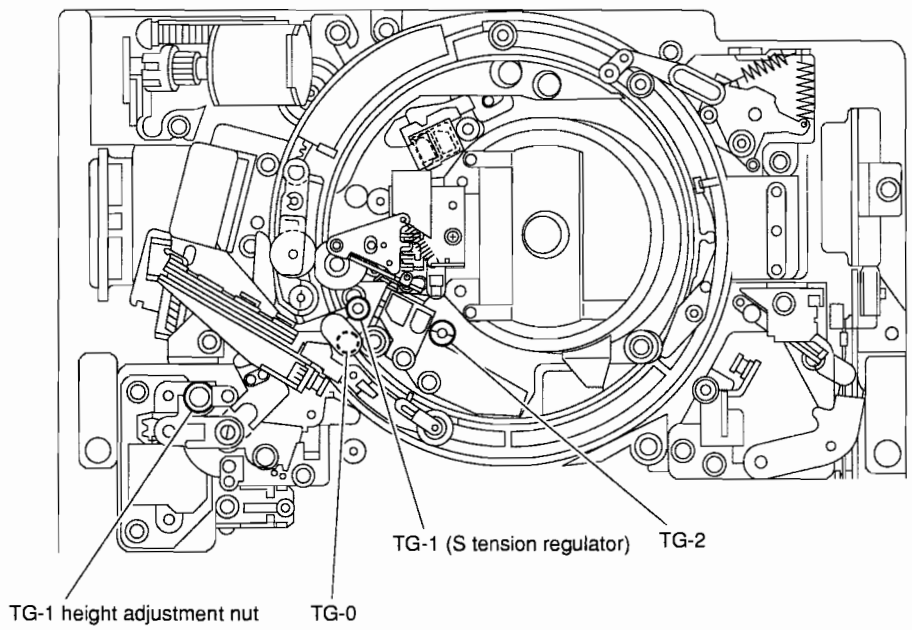
9. Adjust the TG-1 and TG-2 (Entrance Guide) Height

(1) Set the PLAY mode.
(2) Turn the height adjustment nut of TG-1 and the upper flange of TG-2 using a tape guide adjustment driver, and adjust the height of TG-1 and TG-2 so that the specification 1 is met.

10. Check the Tape Running at the Drum Entrance Side Again

Perform steps 3 to 8 and video tracking check (Refer to Section 6-1-3.).

If the specification 1 is not met, perform the adjustment in step 9 again.



Tape Running Adjustment at Drum Entrance Side

Drum Exit Side

Tools

- HDCAM cassette (S cassette) : BCT-40HD
- HDCAM cassette (L cassette) : BCT-124HDL
- Adjustment mirror (Round) : J-6080-029A
- Tape guide adjustment driver (MW-261) : J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the reel table in the S cassette position. (Refer to Section 5-1-4.)
(2) Set the S cassette and place the weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

2. Turn the Power ON

3. PLAY mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 12 and 14.

4. REV × 10 mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 13 and 14.

5. F.FWD mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 12 and 14.

6. REW mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 12 and 14.

7. REV × 1 mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 12 and 14.

8. VAR × −1/30 mode

Check that the tape running condition meet the specification 2.

If it does not, perform steps 13 and 14.

9. Set the L cassette tape

(1) Remove the S cassette.
(2) Press the S1000 switch (C-1/side A) on the SS-88 board, and place the RS table block assembly in the L cassette position.
(3) Set the L cassette and place the weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

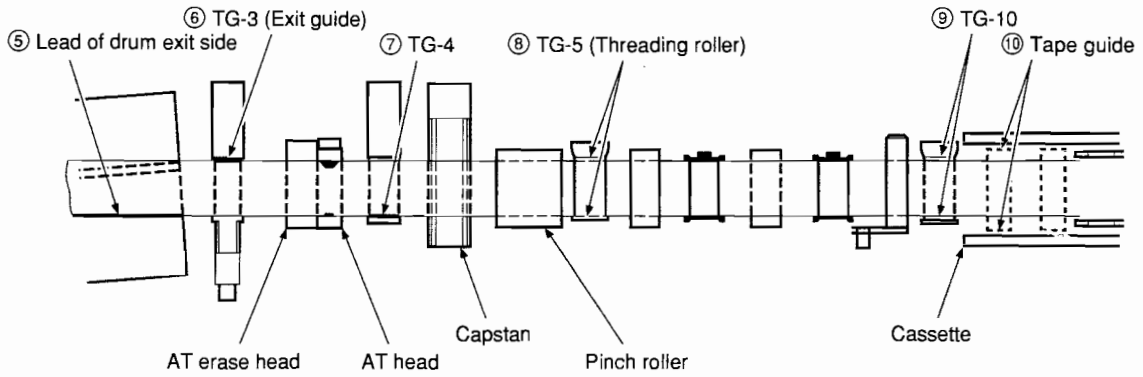
10. Play Back the Tape

Play back the tape beginning portion of the L cassette.

11. Check the Tape Running at the T-side's Tape Guide of the Cassette

Check that the tape running condition meet the specification 3 at TG-10 and the T-side's tape guide of the L cassette.

If specification 3 is not met, perform step 15.



Spec. 2 : ⑤ Lead of drum exit side
The tape runs without any curl at the lead nor rising from the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Spec. 3 : PLAY mode
⑨ TG-10
The tape runs without contacting the upper and lower flanges.

⑩ Tape guide at T side
The tape runs without any curl at the upper and lower portions of the tape guide.

Tape Running Check at Drum Exit Side

Adjustment

12. Adjust the TG-3 (Exit Guide) and TG-4 Height

(1) Set the S cassette and set the PLAY mode.
(2) Turn the upper flanges of TG-3 and TG-4 using the tape guide adjustment driver, and adjust the height of TG-3 and TG-4 so that the specification 2 is met.
(3) Perform video tracking adjustment (Refer to Section 6-1-3.)

13. Adjust the TG-5 (Threading Roller) Height (Only when the specification is not met in the REV × 10 mode and VAR × −1/30 mode)

(1) Set the EJECT mode.
(2) Remove the cassette tape.
(3) Turn the upper flange of TG-5 using the tape guide adjustment driver and adjust the height of TG-5 so that the specification 2 is met.
(4) Set the cassette tape, and set the REV × 10 mode or VAR × −1/30 mode. At this time, check that the tape running condition meet the specification 2.

If it is not met, repeats steps (1) to (4) above.

14. Check the Tape Running at the Drum Exit Side Again

Perform steps 2 to 8 again.

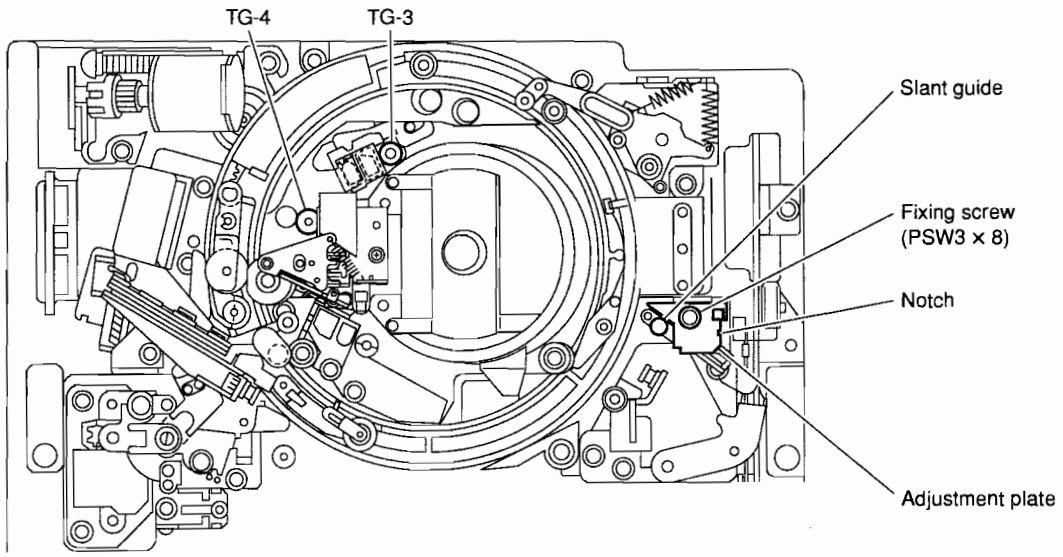
If the specification 2 is not met, perform step 12 again. (If the specification 2 is not met in the REV × 10 mode and VAR × −1/30 mode, perform the adjustment in step 13 again.)

15. Adjust the Slant Guide slantness

(1) Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turns.
(2) Insert a 3 mm flat bladed screwdriver into the notch of the adjustment plate.
(3) Adjust the slantness of the slant guide so that specification 3 is met.
(4) Tighten the screw loosened in step (1).
(5) Check again that specification 3 is met according to steps 9 to 11.

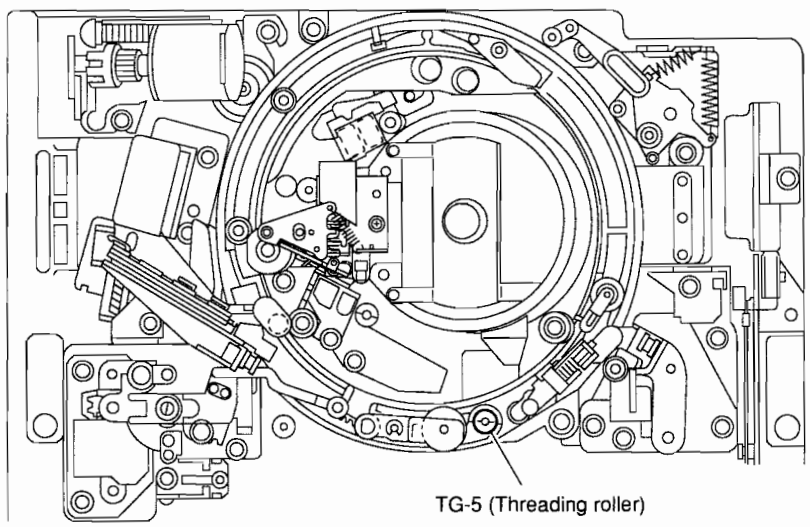
If it is not met, repeat steps (1) to (5) above.

• TG-3 and TG-4 Height Adjustment/Slant Guide Slantness Adjustment



• TG-5 Height Adjustment
(Only when the specification is not met in REV × 10 mode or VAR × −1/30 mode)

<Unthreading End Mode>



Tape Running Adjustment at Drum Exit Side

6-1-3. Video Tracking Check and Adjustment

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)
- Adjustment mirror (Round) : J-6080-029-A
- Tape guide adjustment driver (MW-261) : J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP1201/SS-88 board (SAT ENV signal)
CH-2 : TP203/EQ-85 board (REC AC signal)
CH-3 : TP1110/SS-88 board (1/2 VD signal)
TRIG : TP1110/SS-88 board (1/2 VD signal)

Set the oscilloscope as follows.
CH-1 : 200 mV/DIV
CH-2 : 20 mV/DIV
CH-3 : 5 V/DIV
TRIG : 5 V/DIV
TIME : 1 ms/DIV

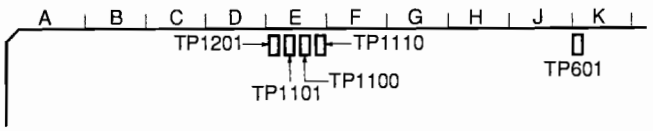
3. Set the Alignment Tape

Set the HR2-1A and place a weight on the cassette so that it does not rise up.
(Use an approximately 1000 g weight.)

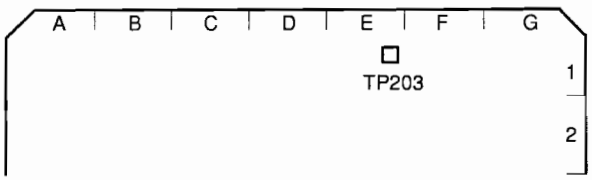
• Connection of the Oscilloscope

CH-1 : TP1201/SS-88 board (SAT ENV signal)
CH-2 : TP203/EQ-85 board (REC AC signal)
CH-3 : TP1110/SS-88 board (1/2 VD signal)
TRIG : TP1110/SS-88 board (1/2 VD signal)

<SS-88 board, Side A>



<EQ-85 board, Side A>



Preparation

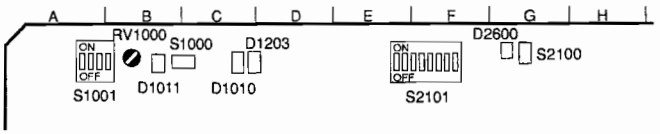
Check

4. Turn the Power ON

5. PLAY mode

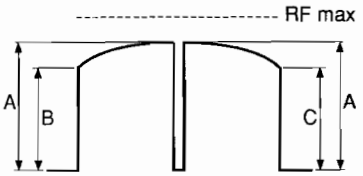
(1) Playback the HR2-1A (00 : 00 to 15 : 00).
(2) Press the S1000 switch on the SS-88 board for more than one second so that the tracking control (RV1000) can be operated.
LED : Check that D1011 lights up.
(3) Turn the RV1000 (tracking control volume) on the SS-88 board and check that the output levels at the entrance and exit sides do not become higher than the output level at the center.
If they become higher, perform the adjustment (at the Drum Entrance Side or Drum Exit Side) from step 13 onwards.

<SS-88 board, Side A>



• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)

<Head-to-Tape Contact> (Tracking control operation enabled) :
D1011 lights up



A = RF max × 0.8

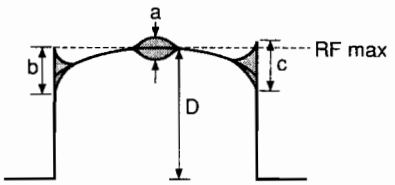
(4) Turn the RV1000 on the SS-88 board clockwise and adjust the center of the RF envelope waveform so that it is 80 % of the maximum output level.
At the same time, check that the RF envelope waveform meet the specification 1.
If the level fluctuates, read the average level. Then press the S1000 on the SS-88 board (D1011 : lights out) and check that the fluctuation amount meet the specification 2.
If specifications 1 and 2 are not met, perform the adjustment (at the Drum Entrance Side or Drum Exit Side) from step 13 onwards .

Spec. 1 : $\frac{B}{A} \times 100 \geqq 70\ \%$

$\frac{C}{A} \times 100 \geqq 70\ \%$

(Output levels (B and C) at the drum entrance side and exit side are more than 70 % of the center of the waveform (A))

<Fluctuation> (Tracking control operation disabled) : D1011 lights out



D = Average value near the waveform center

Spec. 2 : $\frac{a}{D} \times 100 \leqq 20\ \%$

$\frac{b}{D} \times 100 \leqq 20\ \%$

$\frac{c}{D} \times 100 \leqq 20\ \%$

(Fluctuation amounts (a, b, c) at the drum center portion, entrance side and exit side are less than 20 % of the average level (D).)

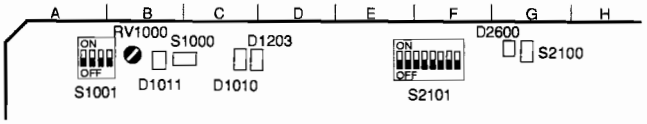
Video Tracking Check (PLAY)

6. REV × 10 mode

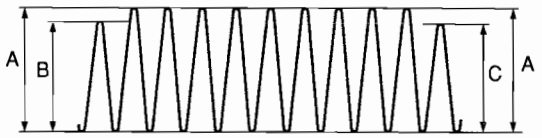
(1) Press the S1000 on the SS-88 board (D1011 : lights out) and fix the tracking control volume.
(2) Play back the HR2-1A.
(3) Set the REV × 10 mode, and check that the RF envelope waveform meet the specification 3-1.

If specification 3-1 is not met, perform the adjustment (at the Drum Entrance Side or Drum Exit Side) from step 13 onwards.

<SS-88 board, Side A>



• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation disabled) : D1011 lights out

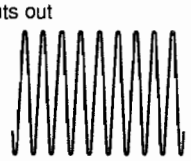


Spec. 3-1 : $\frac{B}{A} \times 100 \geqq 70\ \%$ (Drum entrance side)

$\frac{C}{A} \times 100 \geqq 70\ \%$ (Drum exit side)

• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation disabled) : D1011 lights out

Spec. 4-1 : No waveform lacking exists.

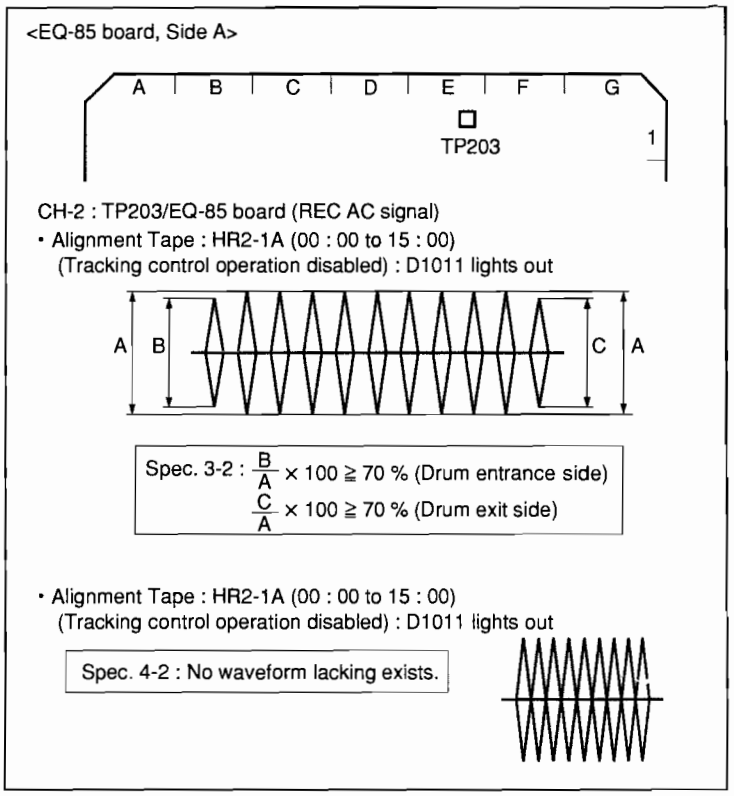


Video Tracking Check REV × 10 (REW)

7. F.FWD and REW Modes

(1) Press the PLAY button and play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the F.FWD mode and check that the RF waveform meet the specifications 3-2 and 4-2.
(3) Set the REW mode and check that the RF waveform meet the specifications 3-1 and 4-1.

If specifications 3-1, 3-2, 4-1 and 4-2 are not met, perform the adjustment (at the Drum Entrance Side or Drum Exit Side) from step 13 onwards.


<EQ-85 board, Side A>
A B C D E F G
TP203
1
CH-2 : TP203/EQ-85 board (REC AC signal)
• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation disabled) : D1011 lights out
A B C A
Spec. 3-2 : B/A × 100 ≧ 70 % (Drum entrance side)
C/A × 100 ≧ 70 % (Drum exit side)
• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation disabled) : D1011 lights out
Spec. 4-2 : No waveform lacking exists.

Video Tracking Check F.FWD

8. REW Mode → PLAY Mode

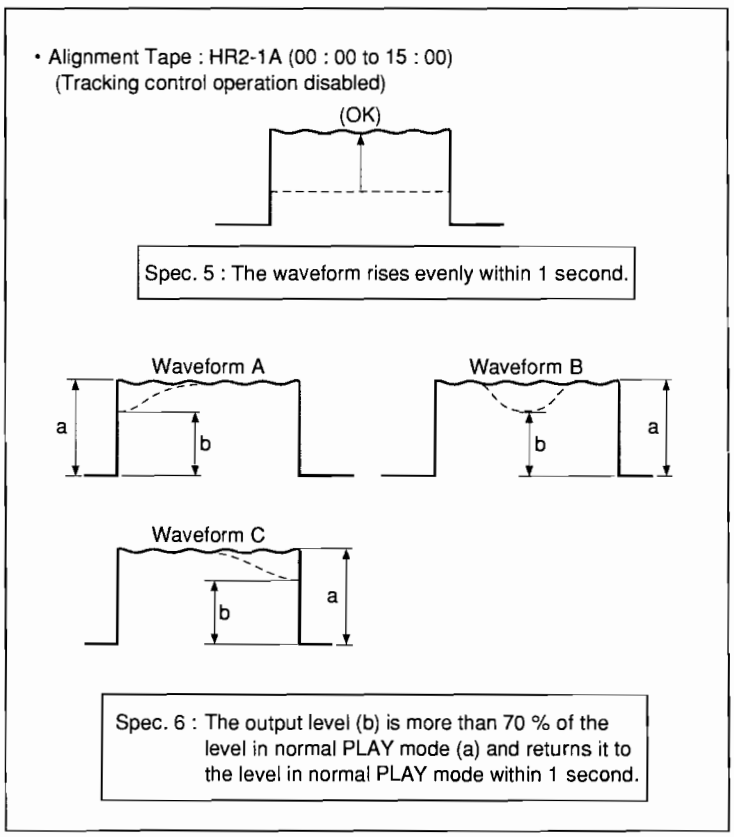
(1) Play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the REW mode and set the PLAY mode 2 to 3 seconds later.

Check that the RF envelope waveform rises evenly within 1 second.
(Specification 5)

Even if the waveform becomes as shown in waveform A, B, or C, if the output level (b) is above 70 % of the level (a) in normal playback, and at the same time, returns to the level in normal playback within 1 second, it is satisfactory.
(Specification 6)

If specification 6 is not met at waveform A or B, check the tape running at the drum entrance side. (Refer to section 6-1-2.)

If specification 6 is not met at waveform C, check the tape running at the drum exit side. (Refer to section 6-1-2.)


• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation disabled)
(OK)
Spec. 5 : The waveform rises evenly within 1 second.
Waveform A
Waveform B
a
b
Waveform C
Spec. 6 : The output level (b) is more than 70 % of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second.

Video Tracking Check (REW → PLAY)

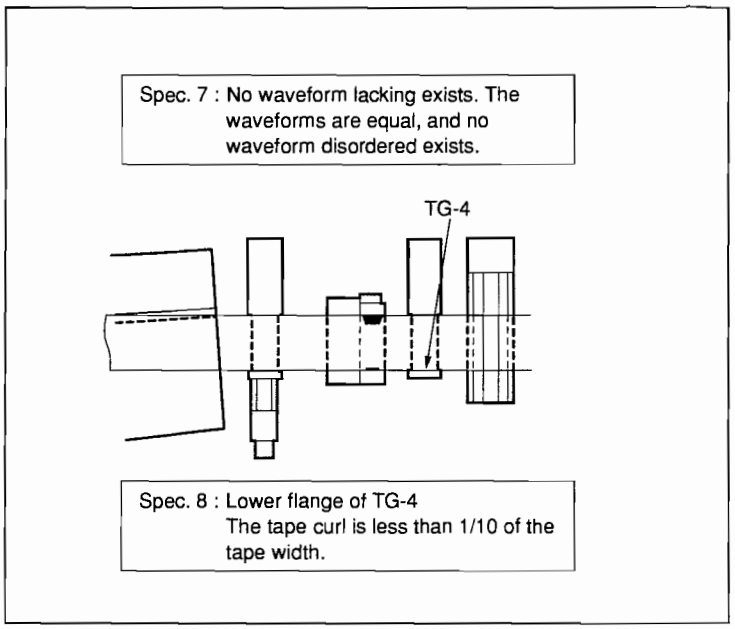
9. VAR × −1/30 Mode

(1) Play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the VAR × −1/30 mode, and check that no RF envelope waveform lacking exists, the waveform are equal, and undisordered. (Specification 7)

If dissatisfactory at the drum entrance side, perform the tracking adjustment at the drum entrance side. (Refer to steps 13 and 14.)
If dissatisfactory at the drum exit side, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

Check that the tape curl at the lower flange of TG-4 is less than 1/10 of the tape width. (Specification 8)

If specification 8 is not met, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)


Spec. 7 : No waveform lacking exists. The waveforms are equal, and no waveform disordered exists.
TG-4
Spec. 8 : Lower flange of TG-4
The tape curl is less than 1/10 of the tape width.

Video Tracking Check (VAR × −1/30, PLAY → VAR × −1/30)

10. PLAY Mode → VAR × −1/30 Mode

(1) Play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the PLAY mode, and set the VAR × −1/30 mode 2 to 3 seconds later.
Check that when the mode is switched, no RF envelope waveform lacking exists, the waveform are equal, and undisordered. (Specification 7)

If dissatisfactory at the drum entrance side, perform the tracking adjustment at the drum entrance side. (Refer to steps 13 and 14.)
If dissatisfactory at the drum exit side, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

Check that the tape curl at the lower flange of TG-4 is less than 1/10 of the tape width. (Specification 8)

If specification 8 is not met, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

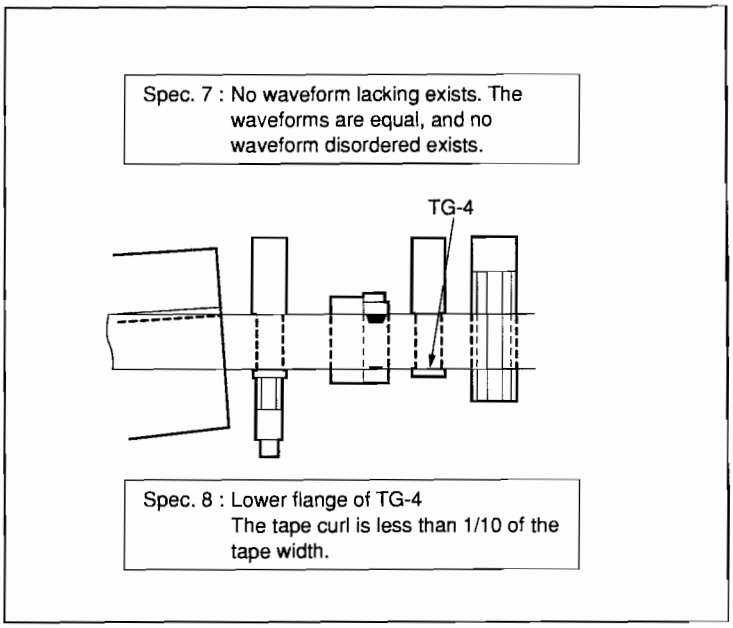
11. VAR × −1 Mode

(1) Play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the VAR × −1 mode, and check that no RF envelope waveform lacking exists, the waveform are equal, and undisordered. (Specification 7)

If dissatisfactory at the drum entrance side, perform the tracking adjustment at the drum entrance side. (Refer to steps 13 and 14.)
If dissatisfactory at the drum exit side, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

Check that the tape curl at the lower flange of TG-4 is less than 1/10 of the tape width. (Specification 8)

If specification 8 is not met, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)


Spec. 7 : No waveform lacking exists. The waveforms are equal, and no waveform disordered exists.
TG-4
Spec. 8 : Lower flange of TG-4
The tape curl is less than 1/10 of the tape width.

Video Tracking Check (VAR × −1/30, PLAY → VAR × −1/30)

12. PLAY Mode → VAR × −1 Mode

(1) Play back the HR2-1A (00 : 00 to 15 : 00).
(2) Set the PLAY mode, and set the VAR × −1 mode 2 to 3 seconds later.
Check that when the mode is switched, no RF envelope lacking exists, the waveform are equal, and undisordered. (Specification 7)

If dissatisfactory at the drum entrance side, perform the tracking adjustment at the drum entrance side. (Refer to steps 13 and 14.)
If dissatisfactory at the drum exit side, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

Check that the tape curl at the lower flange of TG-4 is less than 1/10 of the tape width. (Specification 8)

If specification 8 is not met, first adjust the height of TG-5. If it is still dissatisfactory at the drum exit side after adjusting the height of TG-5, perform the tracking adjustment of the drum exit side. (Refer to steps 15 to 17.)

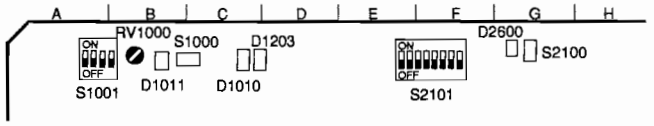
Adjustment

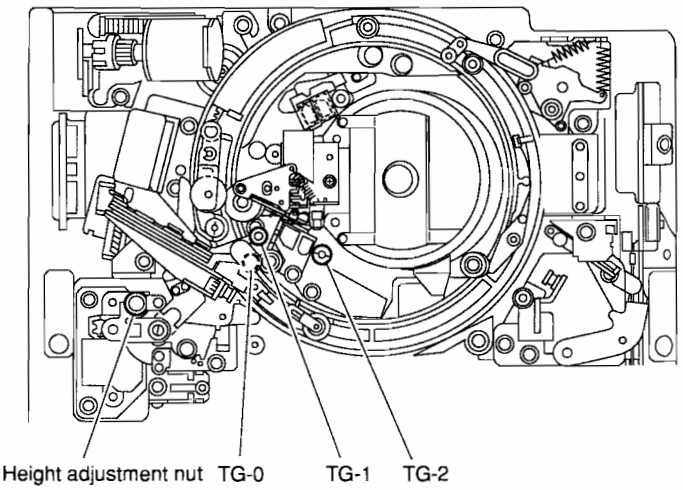
Drum Entrance Side

13. Drum Entrance Side Tracking Adjustment

(1) Playback the HR2-1A (00 : 00 to 15 : 00).
(2) Press the S1000 switch on the SS-88 board for more than one second so that the tracking control can be operated.
LED : Check that D1011 lights up.
(3) Turn the RV1000 on the SS-88 board clockwise and adjust the center of the RF envelope waveform to 80 % of the maximum output level.
(4) Loosen the upper flange of TG-2 so that the tape does not touch the upper flange.
(5) Turn the TG-1 height adjusting nut so that the RF envelope waveform becomes as shown in Fig. 1.
(6) Turn the upper flange of TG-2 and adjust the height of TG-2 so that the RF envelope waveform becomes flat. (Fig. 2)

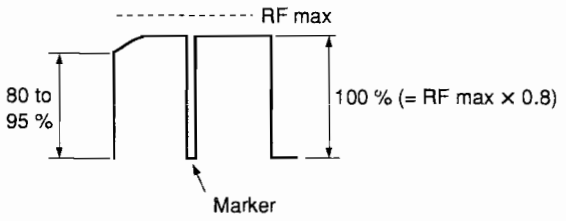
<SS-88 board, Side A>



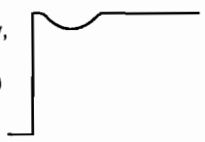


• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation enabled) : D1011 lights up

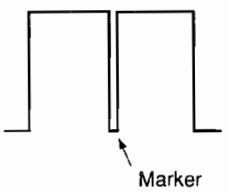
<Fig. 1>



If TG-1 is pressed excessively, the waveform will become as shown in the right figure. (NG)



<Fig. 2>



(7) Check the tape running at the drum entrance side in the following modes.
- PLAY mode
- REV × 10 mode
- F.FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

Perform the following adjustment if the curl of any of the tape guides does not meet the specification 9.

① Change the pressure against the tape at TG-1 and TG-2 within the range shown in Fig. 1.
- If the curl of TG-1 is large :
  Turn the upper flange of TG-2 in the clockwise direction.
- If the curl of TG-2 is large :
  Turn the height adjusting nut of TG-1 in the clockwise direction.

② Adjust the video tracking again.
(Refer to steps 1 to 7 above.)

14. Video Tracking Re-Check

Perform steps 5 to 12.

Note

After adjusting, be sure to press the S1000 switch on the SS-88 board and set the tracking volume operations to the fixed mode.
(LED : D1011 lights out)

<Tape Running Check at Entrance Side>

Spec. 9 : ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

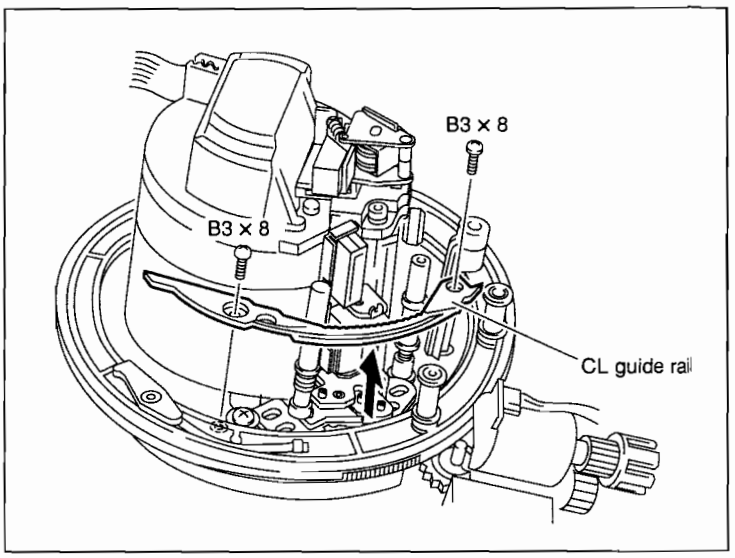
④ Lead of drum entrance side
The tape runs without any curl at the lead nor rising from the lead.

Tracking Adjustment at Drum Entrance Side

Drum Exit Side

15. Remove the CL Guide Rail

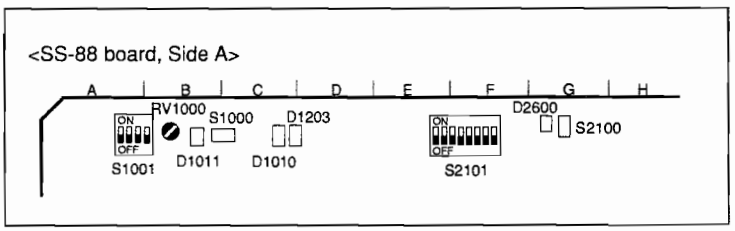
Remove the two screws, and remove the CL guide rail.



Removal of CL Guide Rail

16. Drum Exit Side Tracking Adjustment

(1) Playback the HR2-1A (00 : 00 to 15 : 00).
(2) Press the S1000 switch on the SS-88 board for more than one second so that the tracking control can be operated.
LED : Check that D1011 lights up.
(3) Turn the RV1000 on the SS-88 board, and adjust the center of the RF envelope waveform to 80 % of the maximum output level.
(4) Turn the upper flange of TG-3 counterclockwise by one or two turns so that the tape does not come in contact with the upper flange of TG-3.
(5) Turn the upper flange of TG-4 clockwise so that the tape does not come in contact with the lower flange of TG-4.



(6) Turn the zenith adjustment screw of the AT head and adjust the right portion of the RF envelope waveform so that it is less than 0 to 80 % of the maximum output level. (Fig. 1)
At this time, check that the tape never touches both the upper flange of TG-3 and the lower flange of TG-4.
If the tape touches with flanges, repeat step (4) or (5).
If the tape follows the flanges in steps (4) or (5), perform the following adjustment because it means that there is too much tension either at the upper or lower part of the tape caused by the AT head zenith.
- If the tape follows the upper flange of TG-3 : Turn the zenith adjustment screw counter-clockwise.
- If the tape follows the lower flange at TG-4 : Turn the zenith adjustment screw clock-wise.

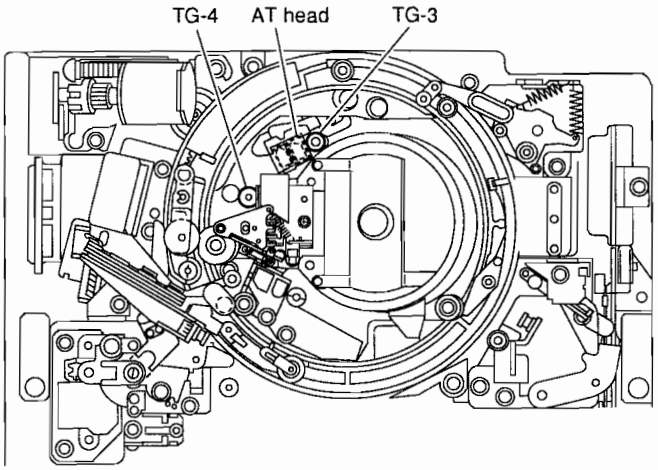
(7) Turn the upper flange of TG-3 clockwise so that it comes in contact with the tape and so that the RF envelope waveform is flat. (Fig. 2)
At this time, the tape should not be touching the lower flange of TG-4.

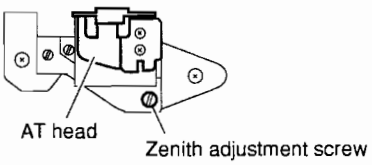
If the waveform does not become flat, perform the following check and adjustment.

① Clean the drum lead with a stick.
(Refer to Section 5-2-5 in Maintenance Manual Part 1.)
② Press down the tape with the stick and check that the tape runs without rising from the drum lead.
③ If the waveform does not become flat at steps ① and ② above, adjust the height of TG-3 so that the RF envelope waveform becomes as flat as possible in the range of specification 10 shown in Fig. 3.
However make sure that TG-3 is not pressed excessively.

Note

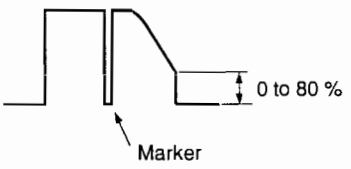
When adjusting the height of TG-3 in step ③, be sure to check the height of the AT head (Refer to Section 6-1-6.).
If the height of the AT head does not meet the specification, perform the video tracking adjustment again from the beginning.



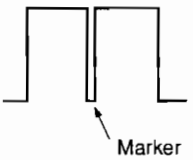


• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation enabled) : D1011 lights up

<Fig. 1>



<Fig. 2>

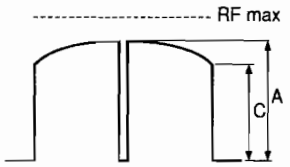


(8) Adjust the height of TG-4 so that the lower flange of TG-4 touches the tape.
(9) Check the tape running at the drum exit side in the following modes.
- PLAY mode
- REV × 10 mode
- F.FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

Perform the following adjustment if the curl of TG-3 does not meet the specification 11.

① Change the zenith of the AT head within the range shown in Fig. 1.
② Adjust the video tracking again.
(Refer to steps (1) to (9) above.)
③ (If the zenith of the AT head has been adjusted)
Perform the following checks and adjustments.
- AT head height (Refer to Section 6-1-6.)
- AT head azimuth (Refer to Section 6-1-7.)
- AT head head-to-tape contact (Refer to Section 6-1-8.)
- AT head position (Refer to Section 6-1-9.)

<Fig. 3>



A = RF max × 0.8

Spec. 10 : $\frac{C}{A} \times 100 \geqq 70\ \%$

<Tape Running Check at Exit Side>

Spec. 11 : ⑤ Lead of drum exit side
The tape runs without any curl at the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Tracking Adjustment at Drum Exit Side

17. Video Tracking Re-Check

Perform steps 5 to 12.

18. Install the CL Guide Rail

Install the CL guide rail using the two screws.

Note

After adjusting, be sure to press the S1000 switch on the SS-75 board, and set the tracking volume operations into the fixed mode.
(LED : D1011 lights out)

6-1-4. CTL Head Height Check and Adjustment

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)
- Tape guide adjustment driver (MW-261) : J-6322-610-A

Preparation

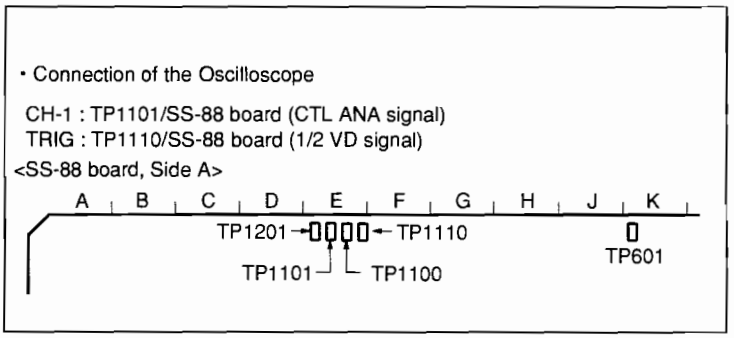
1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : TP1101/SS-88 board (CTL ANA signal)
TRIG : TP1110/SS-88 board (1/2 VD signal)
Set the oscilloscope as follows.
CH-1 : 1 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)



Preparation

Check

4. Turn the Power ON

5. Play Back the Alignment Tape

Play back the HR2-1A.

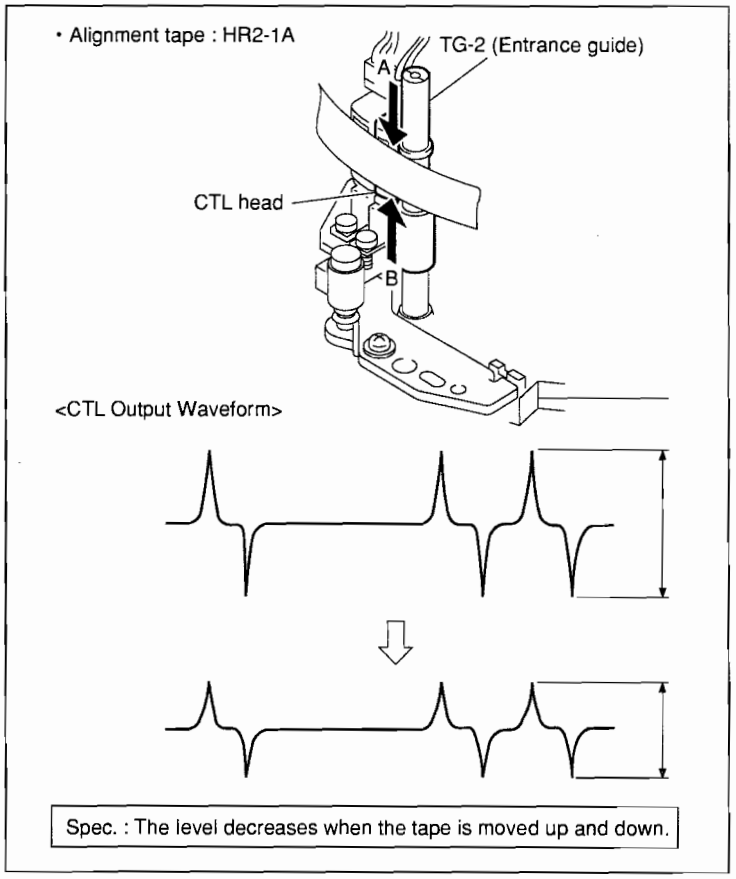
6. Check the CTL Head Height

(1) Check that when portion A of the tape shown in the figure is pressed down, the level decreases.

If the level increases, perform step 7.

(2) Check that when portion B is pressed up in the same way, the level also decreases.

If the level increases, perform step 8.



CTL Head Height Check

Adjustment

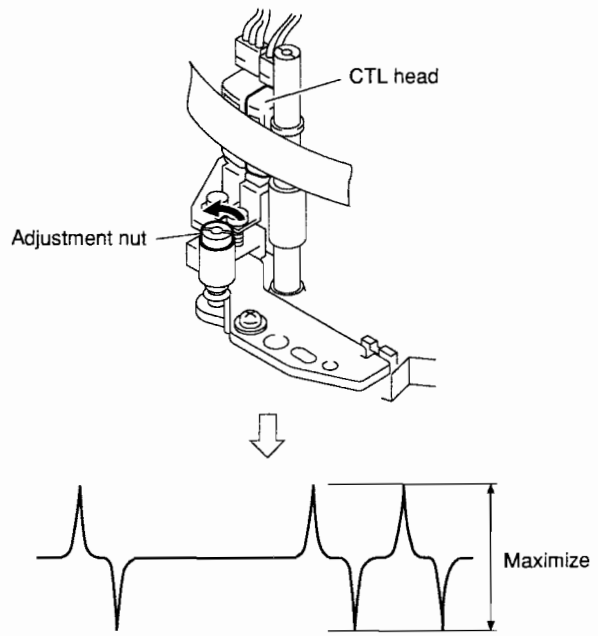
7. In case the Level Increases When the Tape is Pressed Down (Fig. 1)

Turn the height adjustment nut counterclockwise and adjust the output waveform to maximum.

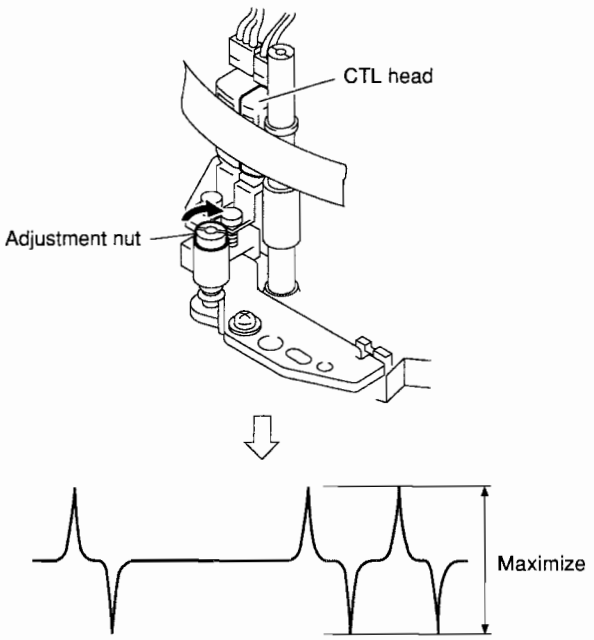
8. In case the Level Increases When the Tape is Pressed Up (Fig. 2)

Turn the height adjustment nut clockwise and adjust the output waveform to maximum.

<Fig. 1>



<Fig. 2>



CTL Head Height Adjustment

6-1-5. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to check the AT head position when the CTL head position has been adjusted.

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)

Preparation

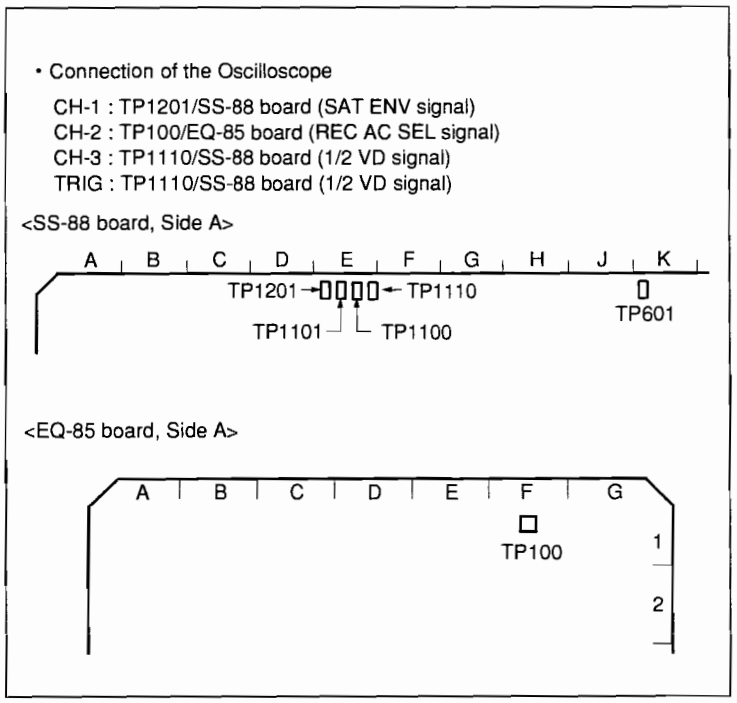
1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : TP1201/SS-88 board (SAT ENV signal)
CH-2 : TP100/EQ-85 board (REC AC SEL signal)
CH-3 : TP1110/SS-88 board (1/2 VD signal)
TRIG : TP1110/SS-88 board (1/2 VD signal)
Set the oscilloscope as follows.
CH-1 : 1 V to 200 mV/DIV
CH-2 : 2 V/DIV
CH-3 : 5 V/DIV
TRIG : 5 V/DIV
TIME : 1 ms/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)



Preparation

Check

4. Turn the Power ON

5. Play Back the Alignment Tape

Play back the HR2-1A (00 : 00 to 15 : 00).

6. Check the CTL Head Position

(1) Press the S1000 switch on the SS-88 board for more than one second so that the tracking control (RV1000) can be operated.
LED : Check that D1011 lights up.

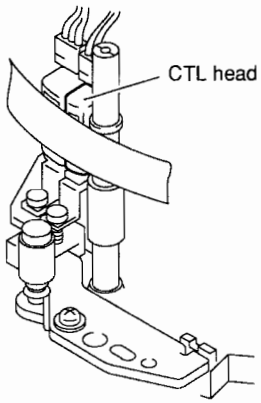
(2) Turn RV1000 (tracking control volume) on the SS-88 board so that the output level at the center of the RF envelope waveform becomes maximum. At this time, check that the marker is located in the rising portion of the 1/2 VD signal.

(3) Press the S1000 switch on the SS-88 board for more than 1 second and fix the tracking control volume.
LED : Check that D1011 lights out.

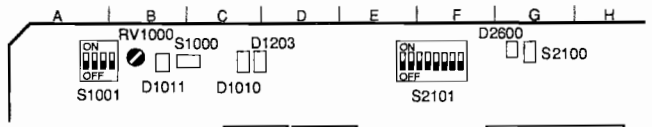
(4) Check that the output level at the center of the RF envelope waveform meet the specification.

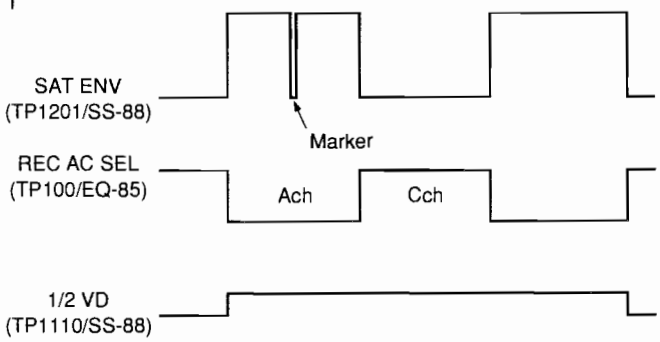
If the specification is not met, perform from step 7 onwards.

• Alignment Tape : HR2-1A (00 : 00 to 15 : 00)
(Tracking control operation enabled) : D1011 lights up



<SS-88 board, Side A>





Spec. : When the tracking control volume is fixed, the output level at the center of the RF envelope waveform is more than 80 % of the maximum output level.

CTL Head Position Check

Adjustment

Note

Perform the following adjustment with the tracking control volume fixed.

7. Loosen the Screw

Loosen the fixing screw of the CTL/FE head assembly by 1/4 to 1/2 turns.

8. Adjust the CTL Head Position

(1) Insert a 3 mm flat bladed screwdriver into the notch of the CTL/FE head assembly.
(2) Adjust the CTL/FE head assembly position so that the output level at the center is maximum and the marker of the RF envelope waveform is located in the rising portion of the 1/2 VD signal.

9. Tighten the Screw

Tighten the screw loosened in step 7.

Tightening torque : 98 × 10^{-2} N•m (10.0 kgf•cm)

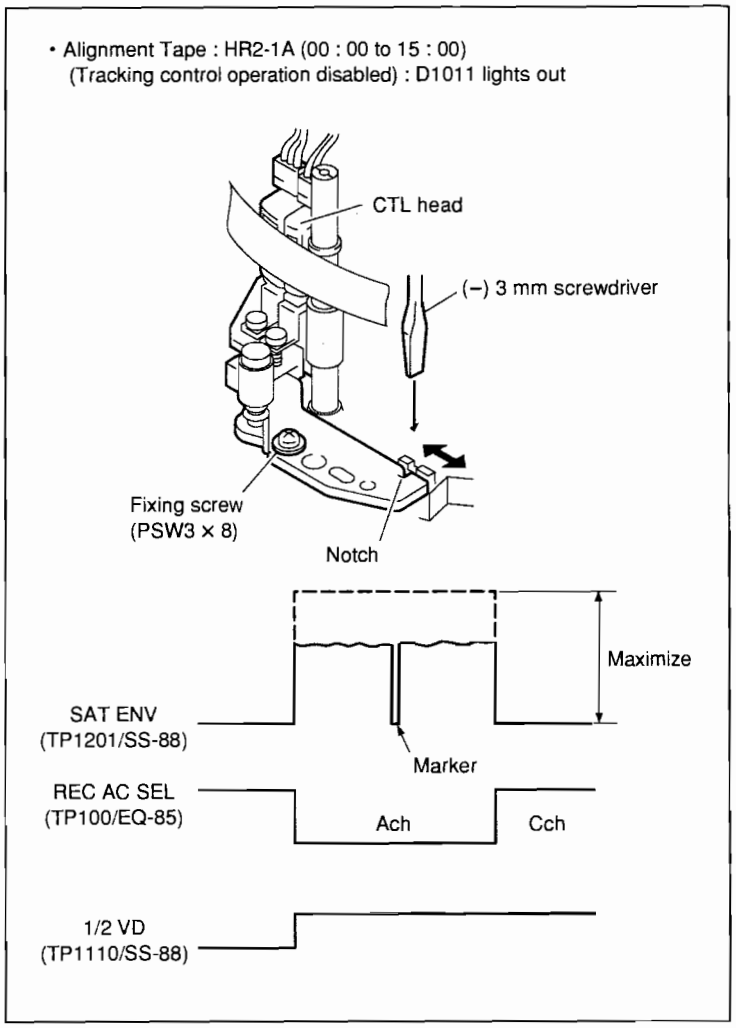
10. Check the CTL Head Position Again

Perform steps 5 and 6 again.

In case the adjustment is performed

11. Adjust the AT Head Position

Refer to Section 6-1-9.



CTL Head Position Adjustment

6-1-6. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the head azimuth adjustment, head head-to-tape contact adjustment, and head position adjustment.
Be sure to perform the adjustments (or checks) according to "In case the adjustment is performed" in this section when the AT head height has been adjusted.

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)

Preparation

1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : AUDIO OUTPUT CUE connector/
connector panel
Set the oscilloscope as follows.
CH-1 : 2 V/DIV
TIME : 200 µs/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

Check

4. Turn the Power ON

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (00 : 00 to 15 : 00) of the HR2-1A.

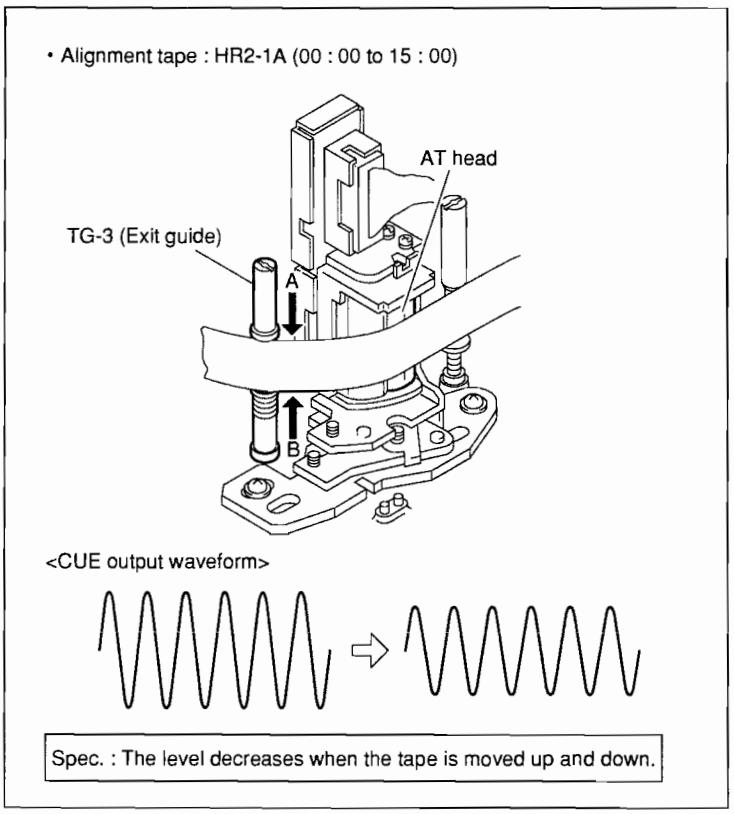
6. Check the AT Head Height

(1) Check that when portion A of the tape shown in the figure is pressed down, the level decreases.

If the level increases, perform step 7.

(2) Check that when portion B is pressed down in the same way, the level also decreases.

If the level increases, perform step 8.



AT Head Height Check

Adjustment

7. In case the Level Increases When the Tape is Pressed Down (Fig. 1)

Turn the height adjustment screw clockwise and adjust the output waveform to maximum.

8. In case the Level Increases When the Tape is Pressed Up (Fig. 2)

(1) Turn the height adjustment screw counter-clockwise and move the AT head below the position at which the output level becomes maximum.

(2) Turn the height adjustment screw clockwise and adjust the output waveform to maximum.

Note

To stabilize the AT head height after the adjustment, set the maximum output level with the AT head moved from bottom to top (with the height adjustment screw turned clockwise).

In case the adjustment is performed

9. Adjust the AT Head Azimuth

Refer to Section 6-1-7.

10. Adjust the AT Head Head-to-Tape Contact

Refer to Section 6-1-8.

11. Adjust the AT Head Position

Refer to Section 6-1-9.

12. Check the AT Head Height Again

Refer to steps 5 and 6 of this section.

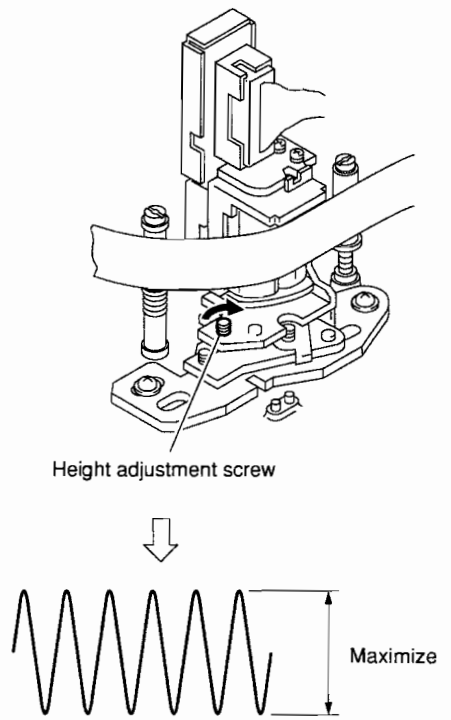
13. Check the AT Head Again

Perform steps 9, 10, and 11 above again.

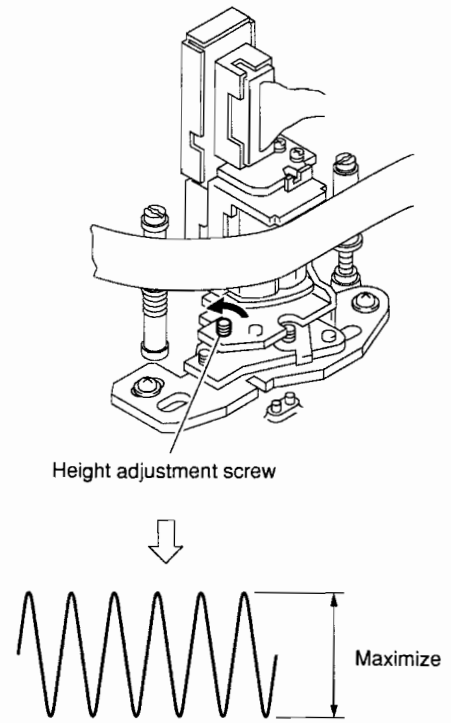
14. Apply the Screw-locking Compound

Refer to Section 6-1.

<Fig. 1>



<Fig. 2>



AT Head Height Adjustment

6-1-7. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to the head-to-tape contact adjustment, head position adjustment, and head height adjustment.
Be sure to perform the adjustments (or checks) according to "In case the adjustment is performed" in this section when the AT head azimuth has been adjusted.

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)

Preparation

1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : AUDIO OUTPUT CUE connector/ connector panel
Set the oscilloscope as follows.
CH-1 : 2 V/DIV
TIME : 200 µs/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

Adjustment

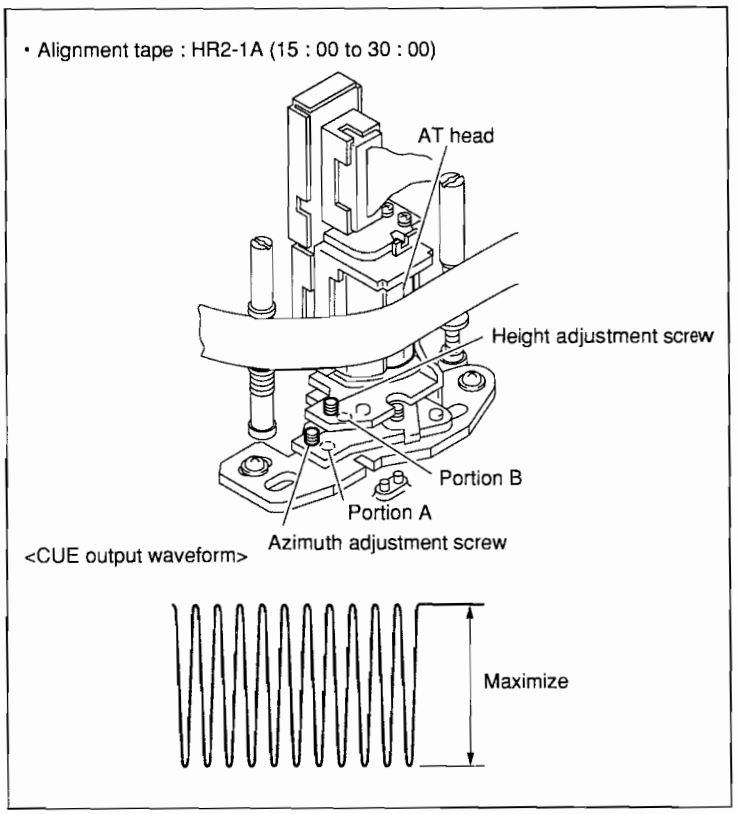
4. Turn the Power ON

5. Play Back the Alignment Tape

Play back the 12 kHz, 0 VU signal portion (15 : 00 to 30 : 00) of the HR2-1A.

6. Adjust the AT Head Azimuth

(1) Turn the azimuth adjustment screw and adjust the output waveform to maximum.
(2) Strike the tip of a screwdriver lightly again portions A and B shown in the figure and check that the level does not change.



AT Head Azimuth Adjustment

In case the adjustment is performed

7. Adjust the AT Head Head-to-Tape Contact

Refer to Section 6-1-8.

8. Adjust the AT Head Position

Refer to Section 6-1-9.

9. Adjust the AT Head Height

Refer to Section 6-1-6.

6-1-8. AT Head Head-to-Tape Contact Check and Adjustment

Note

The AT head head-to-tape contact adjustment is closely related to the head position adjustment, head height adjustment, and head azimuth adjustment.
Be sure to perform the adjustments (or checks) according to "In case the adjustment is performed" in this section when the AT head head-to-tape contact has been adjusted.

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)
- Torque driver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screw driver's bit (+2 mm, length 75 mm) : J-6323-420-A

Preparation

1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : AUDIO OUTPUT CUE connector/ connector panel
Set the oscilloscope as follows.
CH-1 : 2 V/DIV
TIME : 200 µs/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

Check

4. Turn the Power ON

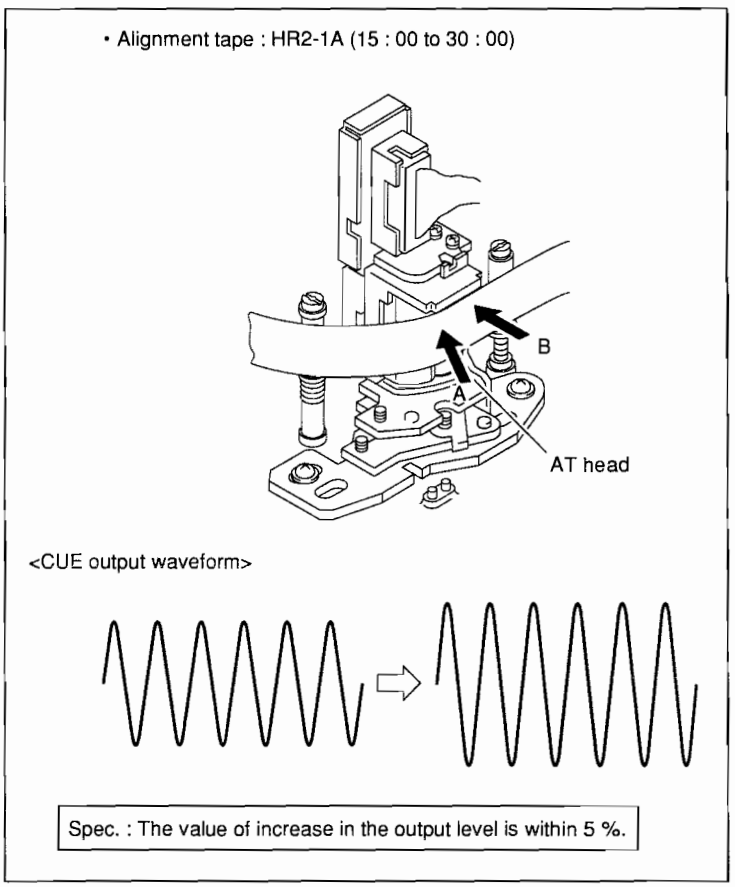
5. Play Back the Alignment Tape

Play back the 12 kHz, 0 VU signal portion (15 : 00 to 30 : 00) of the HR2-1A.

6. Check the AT Head Head-to-Tape Contact

(1) Push portions A and B of the tape shown in the figure lightly. (To increase the wrapping angle of the tape around the AT head.)
(2) Check that increased value of the output level meet the specification.

If the specification is not met, perform from step 7 onwards.



AT Head Head-to-Tape Contact Check

Adjustment

7. Loosen the Screws

Loosen the two head fixing screws by 1/4 to 1/2 turns.

8. Adjust the AT Head Head-to-Tape Contact

(1) Insert a 2 mm flat bladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the AT head so that the output waveform becomes maximum.

9. Tighten the Screws

Tighten the two fixing screws loosened at step 7.

Tightening torque : 19.6×10^{-2} N•m (2 kgf•cm)

10. Check the AT Head Head-to-Tape Contact Again

Perform steps 5 and 6 in this section again.

In case the adjustment is performed

11. Check the AT Head Position

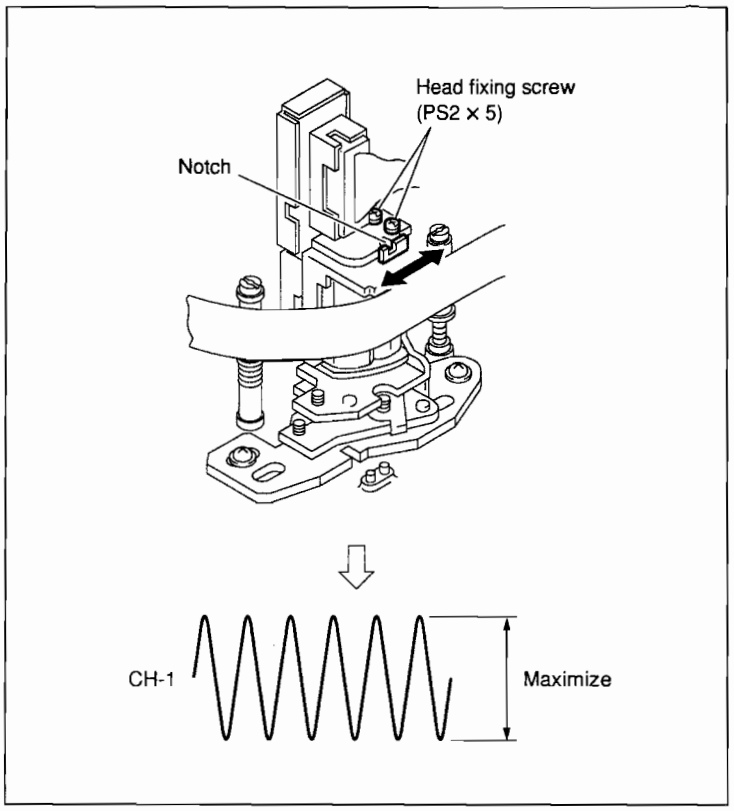
Refer to Section 6-1-9.

12. Check the AT Head Height

Refer to Section 6-1-6.

13. Check the AT Head Azimuth

Refer to Section 6-1-7.



AT Head Head-to-Tape Contact Adjustment

6-1-9. AT Head Position Check and Adjustment

Note

- The CTL head position adjustment must be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as a reference.
- The AT head position adjustment is closely related to the head height adjustment, head azimuth adjustment, and head head-to-tape contact adjustment.
  Be sure to perform the adjustments (or checks) according to "In case the adjustment is performed" in this section when the AT head position has been adjusted.

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)

Preparation

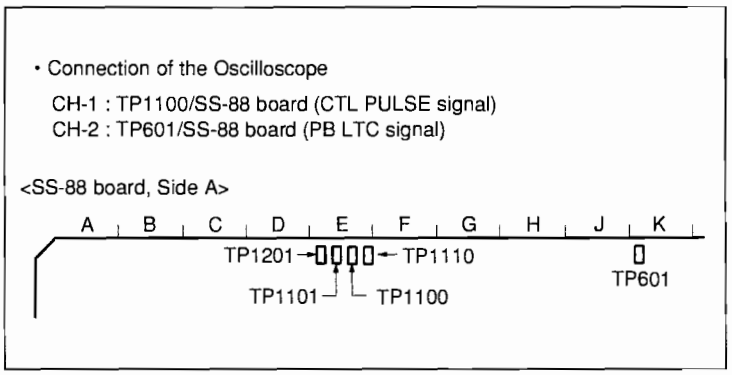
1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : TP1100/SS-88 board (CTL PULSE signal)
CH-2 : TP601/SS-88 board (PB LTC signal)
Set the oscilloscope as follows.
CH-1 : 2 V/DIV
CH-2 : 2 V/DIV
TIME : 5 ms to 500 µs/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)



Preparation

Check

4. Turn the Power ON

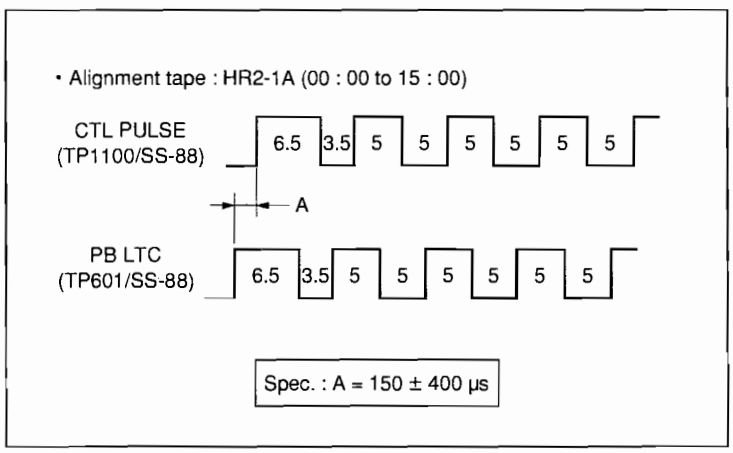
5. Play Back the Alignment Tape

Play back the HR2-1A (00 : 00 to 15 : 00).

6. Check the AT Head Position

Check that the positional relation between the rising edges of the 6.5 : 3.5 pulse of the CTL signal and 6.5 : 3.5 waveform of the PB LTC signal meets the specification.

If the specification is not met, perform from step 7 onwards.



AT Head Position Check

Adjustment

7. Remove the CL Guide Rail
Remove the two screws, and then remove the CL guide rail.

8. Loosen the Screws
Loosen the two fixing screws of the AT head assembly by 1/4 to 1/2 turns.

9. Adjust the AT Head Position
(1) Insert a 3 mm flat bladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is met.

10. Tighten the Screws
Tighten the two screws loosened in step 8.

Tightening torque : 98×10^{-2} N•m (10.0 kgf•cm)

11. Check the AT Head Position Again
Perform steps 5 and 6 of this section again.

12. Install the CL Guide Rail
Install the CL guide rail with the two screws.

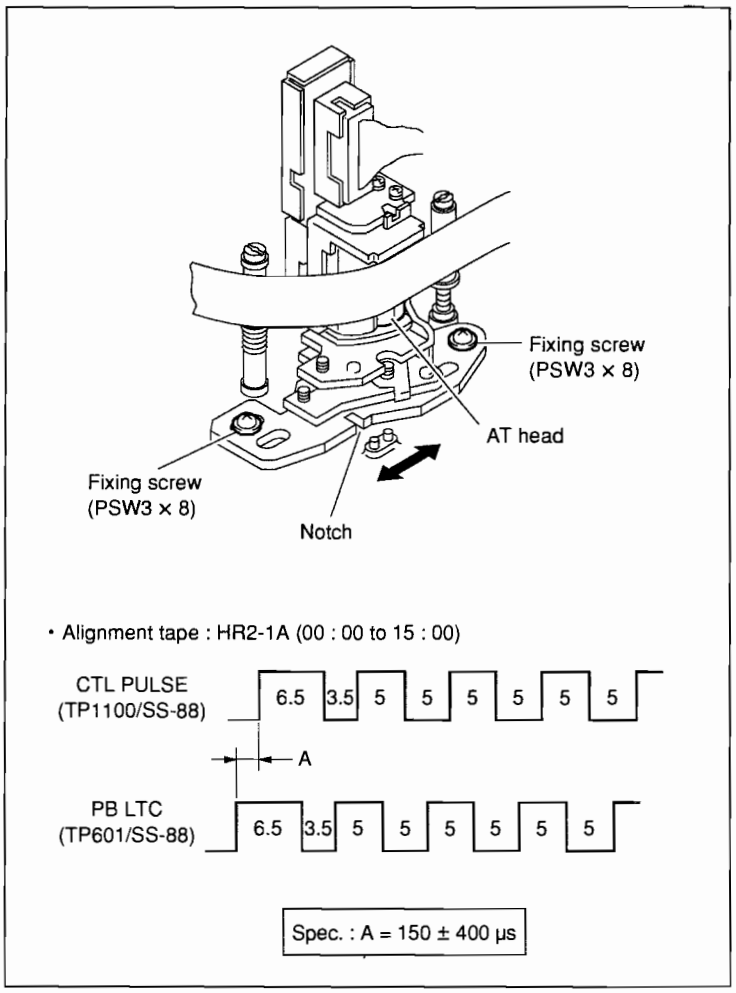
In case the adjustment is performed

13. Check the AT Head Height
Refer to Section 6-1-6.

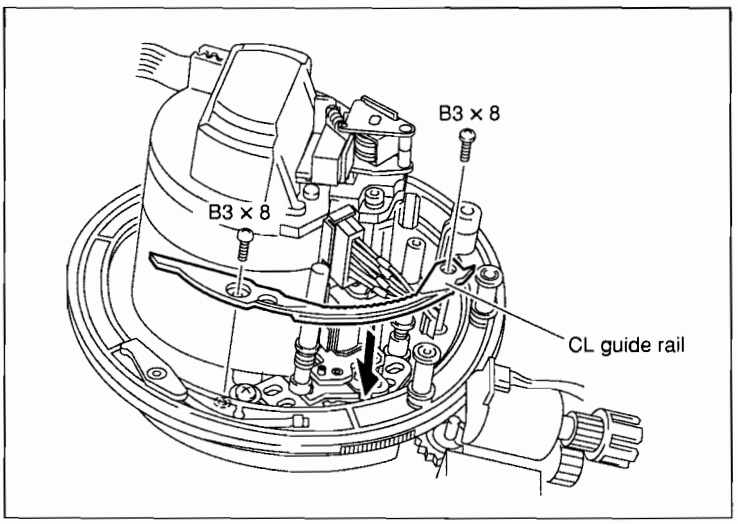
14. Check the AT Head Azimuth
Refer to Section 6-1-7.

15. Check the AT Head Head-to-Tape Contact
Refer to Section 6-1-8.

16. Check the AT Head Position
Refer to steps 5 and 6 of this section.



AT Head Position Adjustment



Installation of CL Guide Rail

6-1-10. CUE Level Check and Adjustment in REV Mode

Tools

- Alignment tape HR2-1A : 8-960-076-11
- Oscilloscope (Sony Tektronix 2465B or equivalent)
- HDCAM cassette, BCT-40HD (S cassette)
- Adjustment mirror (Round) : J-6080-029-A
- Tape guide adjustment driver (MW-261) : J-6322-610-A

Preparation

1. Turn the Power OFF

2. Connect the Oscilloscope

CH-1 : AUDIO OUTPUT CUE connector/
connector panel
Set the oscilloscope as follows.
CH-1 : 2 V/DIV
TIME : 200 µs/DIV

3. Set the Alignment Tape

Set the HR2-1A and place a weight on it so that it does not rise up.
(Use an approximately 1000 g weight.)

Check

4. Turn the Power ON

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (00 : 00 to 15 : 00) of the HR2-1A.

6. Check the CUE Output Level

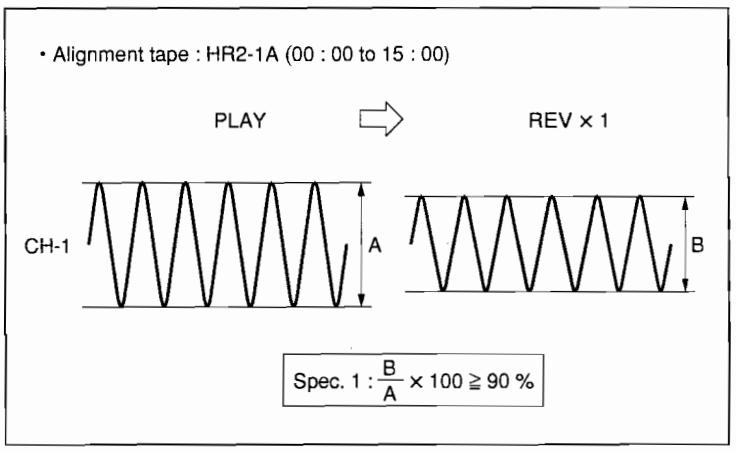
Check the CUE output level A.

7. Set the REV × 1 Mode

8. Check the CUE Output Level

Check that the CUE output level B meet the specification 1.

If the specification 1 is not met, perform from step 9 onwards.



CUE Level Check in REV Mode

Adjustment

9. Adjust the TG-5 (Threading Roller) Height

(1) Play back the 1 kHz, 0 VU signal portion (00 : 00 to 15 : 00) of the HR2-1A.
(2) Set the REV × 1 mode.
(3) If the level increases when portion A of the tape shown in the figure is pressed down, turn the upper flange of TG-5 clockwise using the tape guide adjustment driver.
If the level increases when portion B of the tape shown in the figure is pressed up, turn the upper flange of TG-5 counterclockwise.

Note

When turning the upper flange of TG-5, first press the EJECT button and unthread the tape.

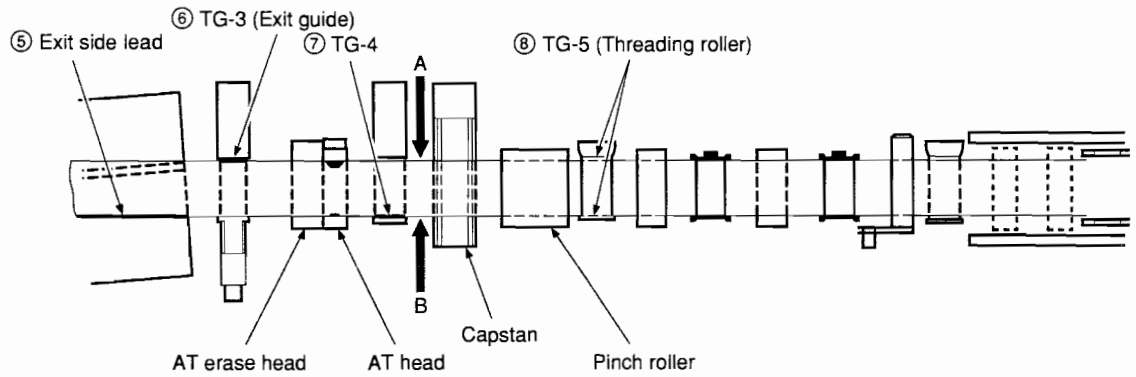
(4) Check that the CUE output level meet the specification 1 again. (Refer to steps 5 to 8.)

If specification 1 is not met, repeat steps (1) to (3) above again.

10. Check Tape Running at the Drum Exit Side

In the modes below, check that the tape running condition meet the specification 2.
(1) PLAY mode
(2) REV × 10 mode
(3) REV × 1 mode

If specification 2 is not met, adjust the height of the tape guides at the drum exit side. (Refer to steps 12 to 14 in Section 6-1-2. (at the Drum Exit Side))
If the height of the tape guide has been adjusted, perform video tracking check. (Refer to Section 6-1-3.)



Spec. 2 : ⑤ Lead of drum exit side
The tape runs without any curl or rising from the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

CUE Level Adjustment in REV Mode

6-2. Adjustment after Replacement of AT Head

6-2-1. Overview

Item List

No.	Item	Board	Adjustment	Point
1	CUE PB FREQ RESPONSE	CUE-10	RV901	CUE
2	CUE PB LEVEL	CUE-10	RV114	TP110
		CUE-10	RV120	CUE
3	CH ERASE CURRENT	CUE-10	LV500	TP505 (X), TP502 (G)
		CUE-10	RV502	TP505 (X), TP502 (G)
		CUE-10	LV501	TP507 (X), TP502 (G)
4	BIAS TUNE, TRAP	CUE-10	T500	TP500
		CUE-10	LV100, LV101	TP103
5	BIAS CURRENT	CUE-10	RV500	TP105 (X), TP106 (G)
6	CUE OA (ROUGH)	CUE-10	CHECK	CUE
		CUE-10	RV100	TP100
7	CUE OA FREQ RESPONSE	CUE-10	CHECK	CUE
		CUE-10	RV103, LV102	TP100
8	CUE OA LEVEL	CUE-10	RV100	CUE
9	CUE OA DISTORTION CHECK	CUE-10	CHECK	CUE
10	LTC PB LEVEL CHECK	CUE-10	CHECK	TP402
11	LTC OA CHECK	CUE-10	CHECK	TP401
			CHECK	TC OUT
		CUE-10	CHECK	TP402
12	TC INS CROSSTALK	CUE-10	RV400, RV401	CUE
13	CUE ERASURE RATIO		CHECK	CUE

Equipment

- Oscilloscope (TEKTRONIX 2465B or equivalent)
- Audio generator (TEKTRONIX SG505-option 02 or equivalent)
- Audio analyzer (TEKTRONIX AA501A-option 02 or equivalent)

Note

Audio analyzer is filtered through 80 kHz L.P.F unless otherwise specified.

- Time code generator (SONY BVG-1600)
- Time code reader (SONY BVG-1500)
- Audio level meter
- Alignment tape HR5-1A (Part number 8-960-076-01)
- HDCAM blank cassette tape

Note

"Blank cassette tape" is indicated a cassette tape on which no video and audio signals are recorded.

6-2-2. Alignment Tape

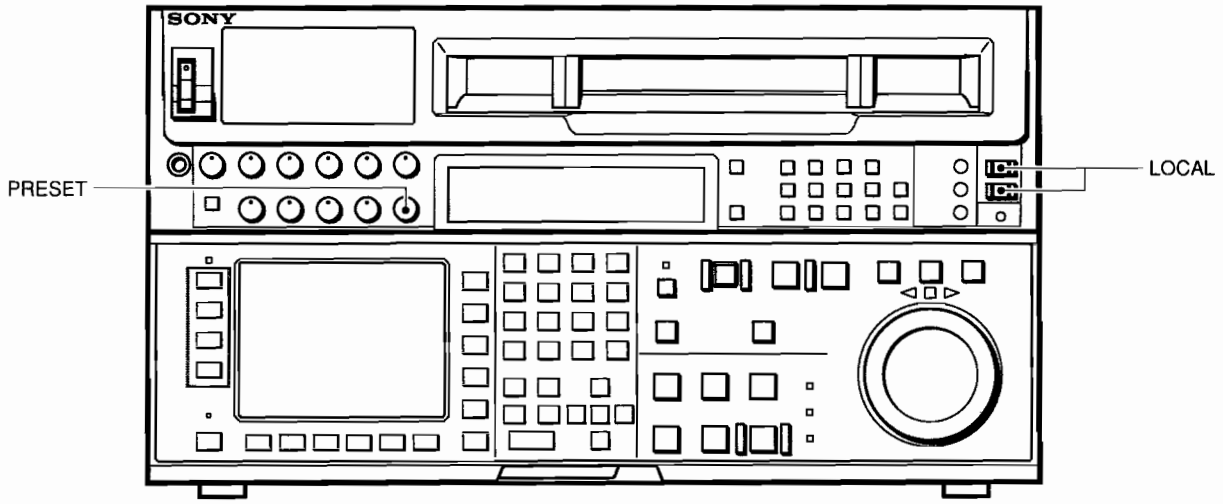
HR5-1A (For digital video system and audio system adjustments)
Part number 8-960-076-01

Contents

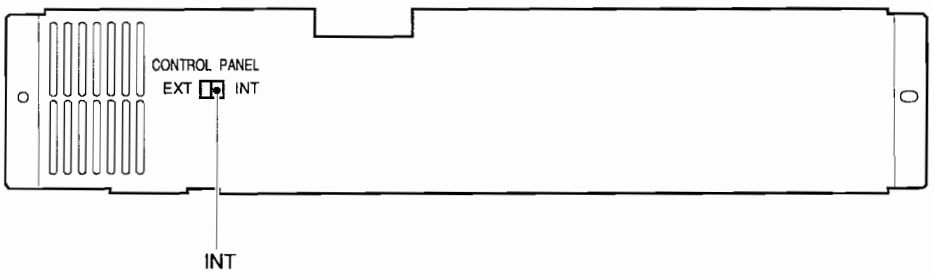
Time min. : sec.	CTL	VIDEO	D-AUDIO	CUE	Time min. : sec.
00 : 00	CTL	Color Bars (100 %)	1 kHz –20 dB FS	1 kHz 0 VU	00 : 00
				Blank	01 : 25
				1 kHz –20 VU	01 : 30
02 : 00			1 kHz 0 dB FS	Blank	02 : 25
				3 kHz –20 VU	02 : 30
				Blank	02 : 55
				7 kHz –20 VU	03 : 00
				Blank	03 : 25
				10 kHz –20 VU	03 : 30
				Blank	03 : 55
04 : 00			–∞ dB FS	12 kHz –20 VU	04 : 00
				Blank	04 : 25
				90 Hz –20 VU	04 : 30
				Blank	04 : 55
				Repeat	05 : 00
06 : 00			20 Hz –20 dB FS		
08 : 00			20 kHz –20 dB FS		
10 : 00		Ramp	Repeat	Repeat	10 : 00
20 : 00		Multi Burst	—	—	20 : 00
30 : 00					30 : 00

6-2-3. Switch Settings

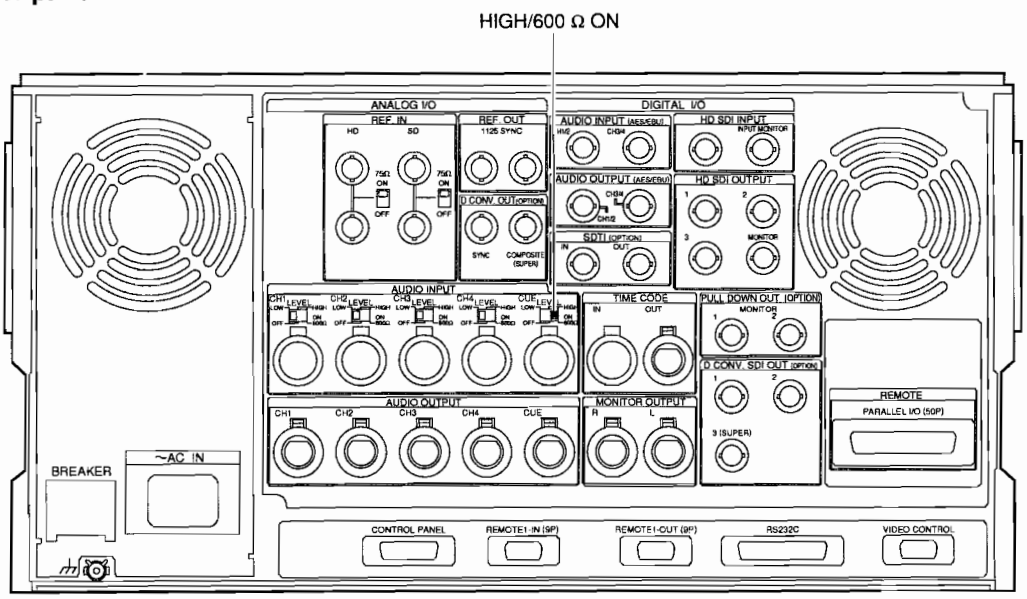
Upper control panel



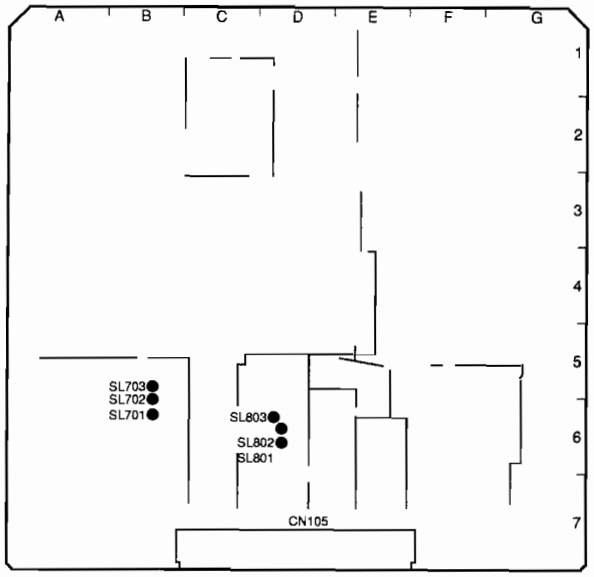
Lower control panel (System setup panel)



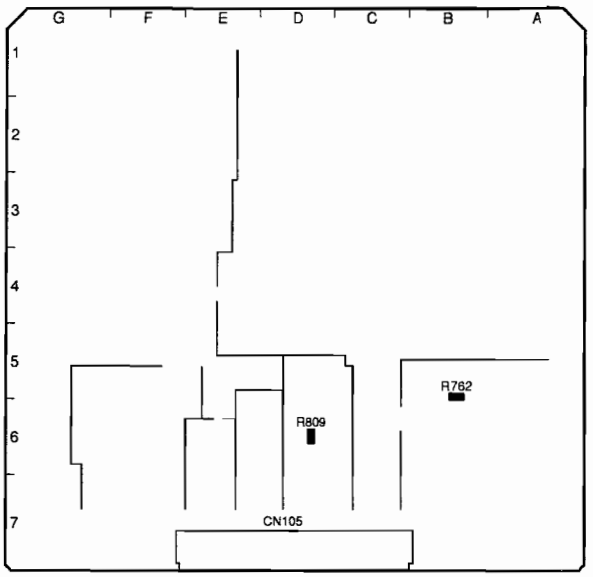
Connector panel



CUE-10 board



CUE-10 Board (A Side)



CUE-10 Board (A Side)

Setting of shorting lands and resistors on the CUE-10 board
(∗ : Components with mounted on the B side)

Settings of output level

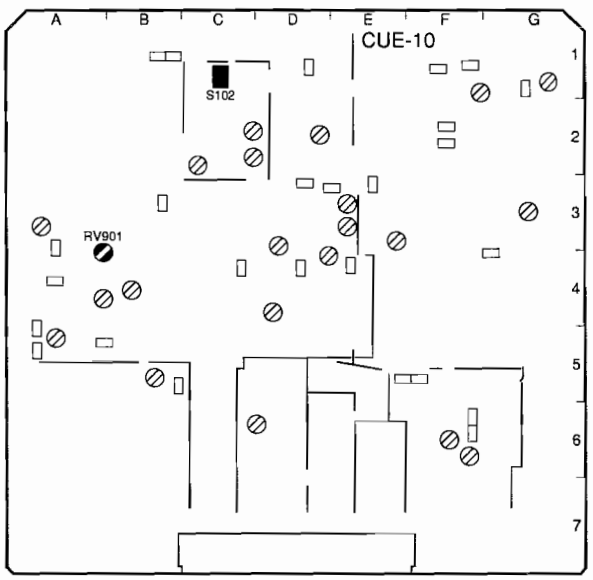
Ref. No.	Output level (dBm/600 Ω)				Fine adjustment (Address No.)
	+4	0	−3	−20	
SL701	OPEN	SHORT	SHORT	OPEN	
SL702	OPEN	OPEN	OPEN	OPEN	RV700
SL703	OPEN	OPEN	OPEN	SHORT	(B-5)
R762*	0 Ω MOUNT	NO MOUNT	NO MOUNT	NO MOUNT	
Factory setting	○				

Settings of input level

Ref. No.	Input level (dBm/600 Ω)				Fine adjustment (Address No.)
	+4	0	−3	−20	
SL801	OPEN	SHORT	OPEN	OPEN	
SL802	OPEN	OPEN	SHORT	OPEN	RV801
SL803	OPEN	OPEN	OPEN	SHORT	(D-6)
R809*	0 Ω MOUNT	NO MOUNT	NO MOUNT	NO MOUNT	
Factory setting	○				

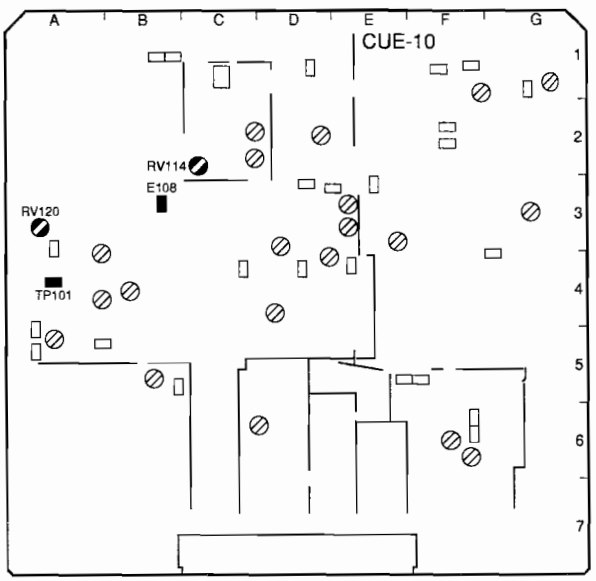
6-2-4. CUE PB Frequency Response Adjustment

<table>
<tr><th>Preparations for adjustment</th><th>Specification</th><th>Adjustment</th></tr>
<tr>
<td>• Play back the 1 kHz, 3 kHz, 7 kHz, 10 kHz, 12 kHz and 90 Hz (each −20 VU) signal portions (from 1 : 30 to 4 : 55) of the alignment tape HR5-1A.</td>
<td>ANALOG AUDIO OUTPUT CUE
<table>
<tr><th>Frequency [Hz]</th><th>Output level [dB]</th></tr>
<tr><td>1 k</td><td>0 (Reference)</td></tr>
<tr><td>3 k</td><td>0 ±0.5</td></tr>
<tr><td>7 k</td><td>0 ±0.5</td></tr>
<tr><td>10 k</td><td>0 ±0.5</td></tr>
<tr><td>12 k</td><td>−0.2 ±0.5</td></tr>
<tr><td>90</td><td>0 $^{+0.7}_{-1.7}$</td></tr>
</table>
Note Correct the output levels by the correction value of the alignment tape.</td>
<td>⊘RV901/CUE-10 (A-4)</td>
</tr>
</table>



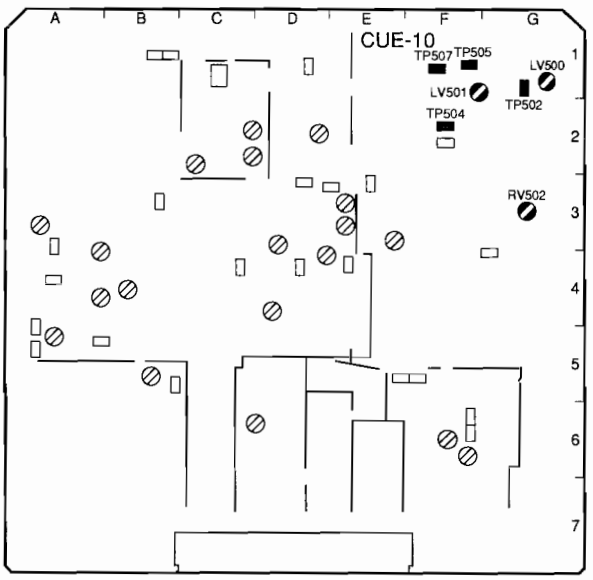
6-2-5. CUE PB Level Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Shorten between TP101 and E108 on the CUE-10 board by a shorting clip. • Play back the 1 kHz 0 VU signal portion (from 0 : 00 to 1 : 25) of the alignment tape HR5-1A.	ANALOG AUDIO OUTPUT CUE 4.0 ±0.1 dBu (terminated by 600 Ω)	PB LEVEL ADJ ⊘RV114/CUE-10 (C-2)
Step 2 • Disconnect the shorting clip. • Play back the 1 kHz 0 VU signal portion (from 0 : 00 to 1 : 25) of the alignment tape HR5-1A.	ANALOG AUDIO OUTPUT CUE 4.0 ±0.1 dBu (terminated by 600 Ω)	PB REF ADJ ⊘RV120/CUE-10 (A-3)



6-2-6. Channel Erase Current Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the audio level meter to TP505 (X) and TP502 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	TP505/CUE-10 (F-1) Maximize the level.	⊘LV500/CUE-10 (G-1)
	TP505/CUE-10 (F-1) 160 ±5 mVrms	⊘RV502/CUE-10 (G-3)
• Disconnect the audio level meter and monitor the waveforms of TP505 (X) and TP502 (G) by the oscilloscope.	Distortion is not be appeared.	Check
Step 2 • Connect the audio level meter to TP507 (X) and TP504 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	TP507/CUE-10 (F-1) Maximize the level. (More than 120 mVrms)	⊘LV501/CUE-10 (F-1)
• Disconnect the audio level meter and monitor the waveforms of TP507 (X) and TP504 (G) by the oscilloscope.	Distortion is not be appeared.	Check

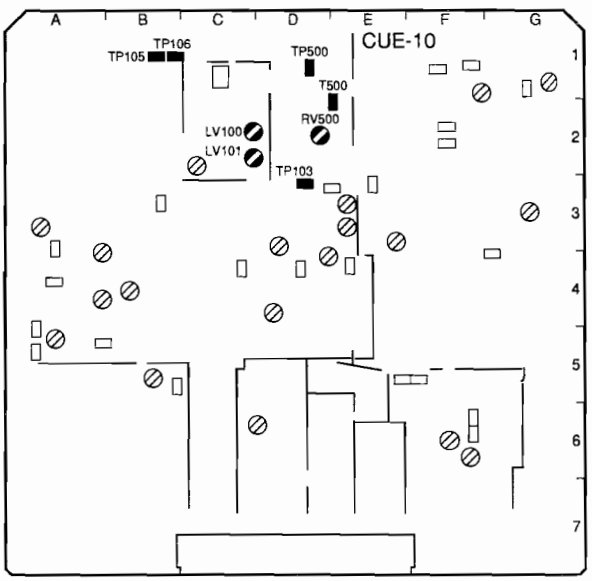


6-2-7. Bias Tune and Bias Trap Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the oscilloscope to TP500 on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	TP500/CUE-10 (D-1) Maximize the level.	BIAS TUNE ⊘T500/CUE-10 (E-1)
Step 2 • Connect the oscilloscope to TP103 on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	TP103/CUE-10 (D-3) Minimize the level. (The level is less than +10 dBu.) LV100 LV101 **Note** Turn LV100 and LV101 in parallel.	BIAS TRAP ⊘LV100/CUE-10 (C-2) ⊘LV101/CUE-10 (C-2)

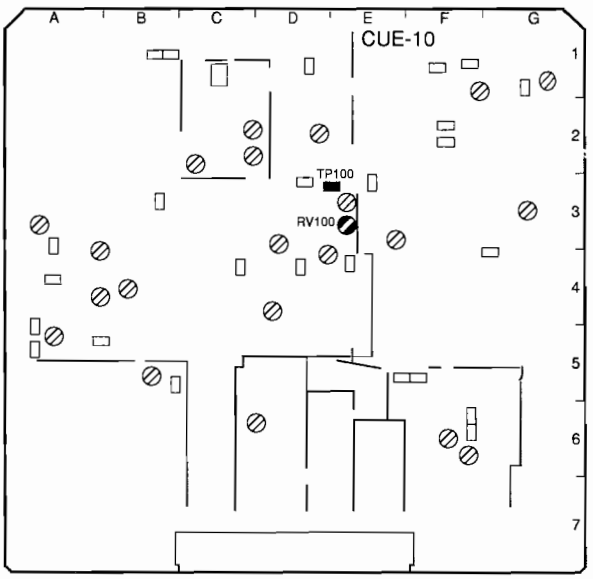
6-2-8. Bias Current Adjustment

Preparations for adjustment	Specification	Adjustment
• Connect the audio level meter to TP105 (X) and TP106 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select an REC mode.	TP105/CUE-10 (B-1) 16.0 ±0.5 mVrms	⊘RV500/CUE-10 (D-2)



6-2-9. CUE OA Level Rough-check

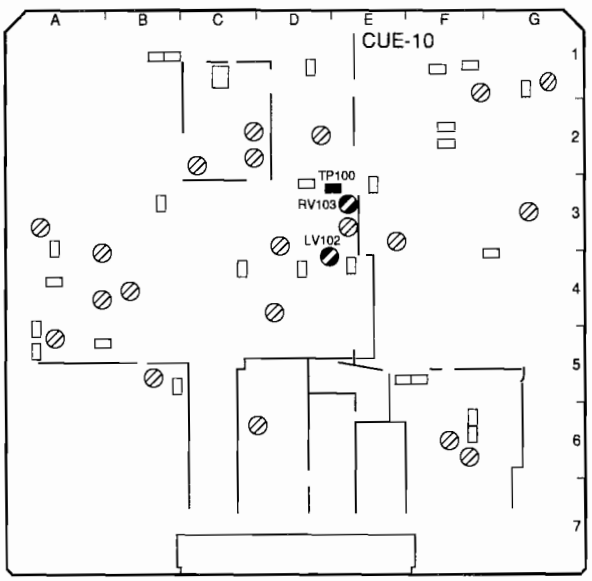
Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz +4.0 dBu signal (terminated by 600 Ω) to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion. • The value of the CUE OUT at this time is referred to as "value 1."	ANALOG AUDIO OUTPUT CUE +4.0 ±0.5 dBu (terminated by 600 Ω) Correction value = "value 1" −4.0 If the correction value exceeds ±0.5 dB, carry out the step 2.	
Step 2 If the specification is not met, carry out the following steps. • Connect the audio level meter to TP100 on the CUE-10 board. • Select the REC mode. • The value of the audio level meter at this time is referred to as "value 2."	TP100/CUE-10 (E-3) Specification = "value 2" – correction value Adjust the level of TP100 to meet the specification and re-check the step 1.	REC LEVEL ADJ ⊘RV100/CUE-10 (E-3)



6-2-10. CUE OA Frequency Response Check

<table>
<tr><th>Preparations for adjustment</th><th>Specification</th><th>Adjustment</th></tr>
<tr><td>Step 1
• Insert an HDCAM blank cassette tape and record the 1 kHz, 10 kHz and 12 kHz (each −16 dBu) signals.
• Play back the recorded portions.
• The values of the CUE OUT at this time are referred to as "value 1 (1), (10) and (12)."</td><td>ANALOG AUDIO OUTPUT CUE
<table><tr><th>Frequency [Hz]</th><th>Output level [dB]</th></tr><tr><td>1 k</td><td>0 (Reference)</td></tr><tr><td>10 k</td><td>0 ±0.7</td></tr><tr><td>12 k</td><td>0 ±0.7</td></tr></table>Correction value (10) or (12) = "value 1 (10) or (12)" − "value 1 (1)"
If the correction values exceed the specifications, carry out the step 2.</td><td></td></tr>
<tr><td>Step 2
If the specification is not met, carry out the following steps.
• Connect the audio level meter to TP100 on the CUE-10 board.
• Record the 10 kHz and 12 kHz (each −16 dBu) signals.
• The values of the level meter at this time are referred to as "value 2 (10) and (12)."</td><td>TP100/CUE-10 (E-3)
Specification (10) = "value 2 (10)" − "correction value (10)"
Specification (12) = "value 2 (12)" − "correction value (12)"

Adjust the level of TP100 to meet each specification for each frequency and re-check the step 1.</td><td>10 kHz : ⊘ RV103/CUE-10 (E-3)
12 kHz : ⊘ LV102/CUE-10 (D-4)</td></tr>
</table>

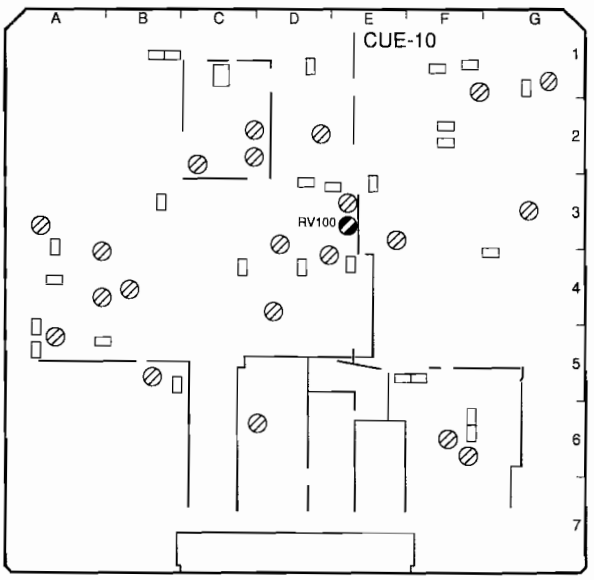


6-2-11. CUE OA Level Adjustment

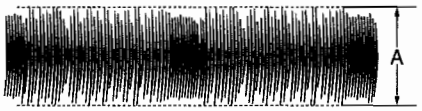
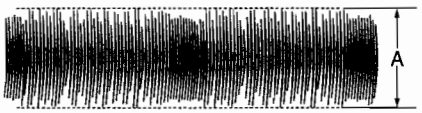
Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz +4.0 dBu signal (terminated by 600 Ω) to ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion.	ANALOG AUDIO OUTPUT CUE +4.0 ±0.2 dBu (terminated by 600 Ω)	⊘RV100/CUE-10 (E-3)

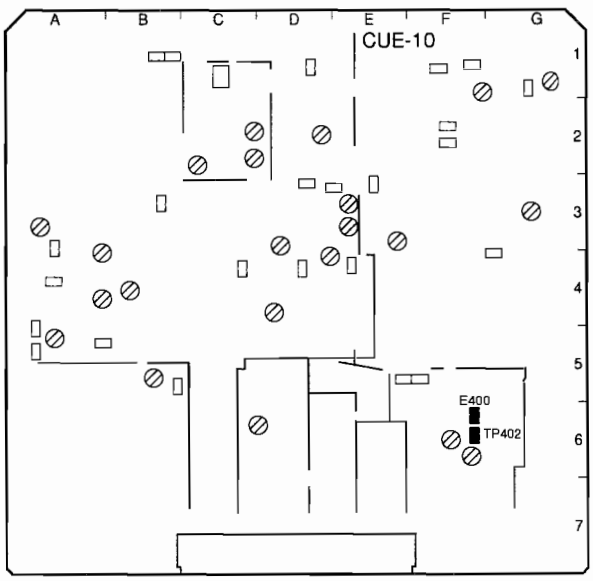
6-2-12. CUE OA Level Distortion Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz +4.0 dBu signal (terminated by 600 Ω) to ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion.	ANALOG AUDIO OUTPUT CUE 2 % or less	Check

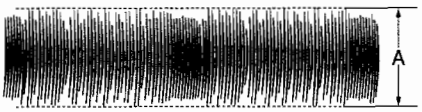


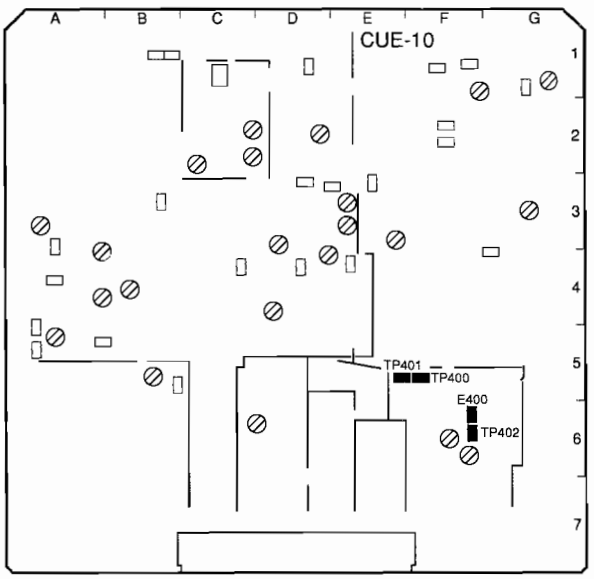
6-2-13. LTC PB Level Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the oscilloscope to TP402 (X) and E400 (G) on the CUE-10 board. • Play back the alignment tape HR5-1A.	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check
Step 2 • Play back at the following speed. (a) REW (b) REV shuttle × 5 (c) REV shuttle × 1/5	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check (1) If the specification is not met, clean the head. (2) If the specification is not met after the step (1) is carried out, re-carry out "Section 6-1-10. CUE Level Check and Adjustment in REV Mode" and re-check from "Section 3-2-5. CUE PB Frequency Response Adjustment."



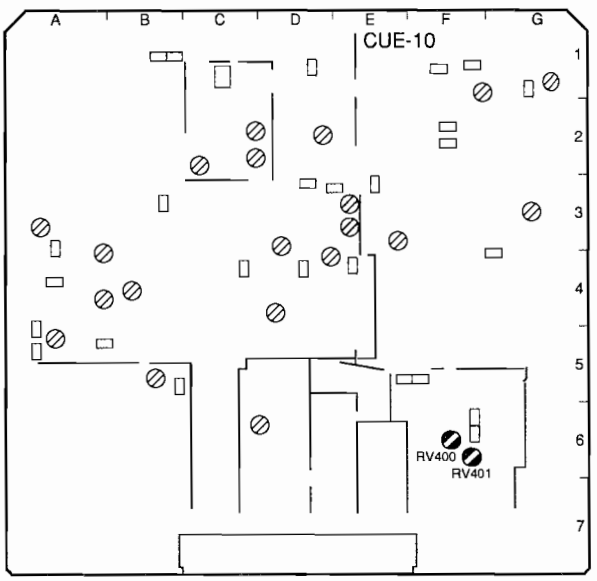
6-2-14. LTC OA Check

Preparations for adjustment	Specification	Adjustment
Step 1 • Connect the LTC OUT of BVG-1600 to the TIME CODE IN connector on the connector panel. • Connect the oscilloscope to TP400 (X) and TP401 (G) on the CUE-10 board. • Insert an HDCAM blank cassette tape and select the REC mode.	TP401/CUE-10 (F-5) 60 ±5 mVp-p	Check
Step 2 • Connect the LTC IN of BVG-1500 to the TIME CODE OUT connector on the connector panel. • Play back the recorded portion at the step 1.	TIME CODE OUT The waveform can be monitored by the BVG-1500.	Check
Step 3 • Connect the oscilloscope to TP402 (X) and E400 (G) on the CUE-10 board. • Play back the recorded portion at the step 1 in the following four modes. (a) PLAY (b) REW (c) REV SHUTTLE × 5 (d) REV SHUTTLE × 1/5	TP402/CUE-10 (F-6)  A ≧ 80 mVp-p	Check



6-2-15. TC Insert Crosstalk Adjustment

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply no signal to the ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Play back the recorded portion. • Press the INSERT TIME CODE button. • Press the EDIT button after pressing the PLAY button.	ANALOG AUDIO OUTPUT CUE The level is be less than −18 dBu. (30 kHz LPF) Alternately adjust to meet the specification and to be minimum level.	⊘RV400/CUE-10 (F-6) ⊘RV401/CUE-10 (F-6)



6-2-16. CUE Erasure Ratio check

Preparations for adjustment	Specification	Adjustment
Step 1 • Supply the 1 kHz +13.5 dBu (terminated by 600 Ω) to ANALOG AUDIO INPUT CUE connector on the connector panel. • Insert an HDCAM blank cassette tape and select the REC mode. • Rewind half of the recorded portion. • Supply no signal to the ANALOG AUDIO INPUT CUE connector on the connector panel. • After pressing the INSERT CUE button, press the PLAY button and the EDIT button. • Play back the recorded portion. • Monitor the signal level of the ANALOG AUDIO INPUT CUE connector on the connector panel through B.P.F (1 kHz).	ANALOG AUDIO OUTPUT CUE Difference of the level between signal portion and no signal portion is more than 65 dB.	Check (1) If the specification is not met, clean the head. (2) If the specification is not met after the step (1) is carried out, re-carry out "Section 6-1-8. AT Head Head-to-Tape Contact Check and Adjustment" and re-check from "Section 3-2-5. CUE PB Frequency Response Adjustment."

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

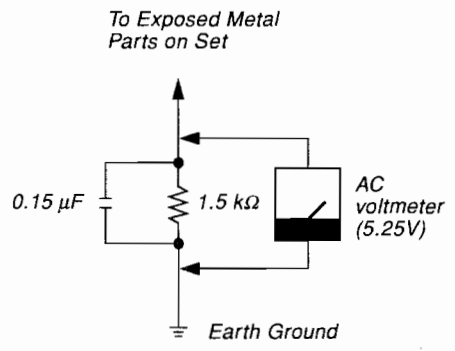

Fig A. Using an AC voltmeter to check AC leakage.

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